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3924 MEADE ST.
DENVER, COLORADO

CONTENTS

TRADE NAME	MODEL	SET AND FOLDER No.
Airline	61-6788	264-2
Arvin	21-554KM, KMU, 21-555TG, TGU, TM, TMU, 21-557TM, TMU (Ch. TE383 "E" Series, TE-383UHF "E" Series)	264-3
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SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 4 IN SET 203

Capehart Chassis CT-75, CT-77 and CT-81 (Ch. Series CX-37) are covered in Photofact Folder 4 — Set 203. Several chassis and models have since been added to the CX-37 series. A list of all the models with the chassis used in each is given below.

MODEL	CHASSIS	MODEL	CHASSIS	MODEL	CHASSIS
1C213	CT-77	5C214	CT-121	11F244-1	CT-112
1T172A	CT-75	5C214B	CT-121	11W212A	CT-81
1T174	CT-99	5C214B-1	CT-123	12F274	CT-95
1T174BS	CT-126	5C214D	CT-115	12F274M	CT-95
1T174B-1	CT-110	5C214D-1	CT-116	12F274M-1	CT-112
1T174BS-1	CT-127	5C214M	CT-121	12F274-1	CT-112
1T174MS	CT-126	5C214MD	CT-115	14W214	CT-122
1T174MS-1	CT-127	5C214MD-1	CT-116	14W214-1	CT-124
1T174M-1	CT-110	5C214M-1	CT-123	15W214	CT-122
1T174S	CT-99	5C214-1	CT-123	15W214BD-1	CT-134
1T174S-1	CT-110	5F212A	CT-77	15W214MD-1	CT-134
1T174-1	CT-110	5H213	CT-77	15W214-1	CT-124
2T214	CT-110	6F213	CT-77	16T244	CT-95
2T214BS	CT-128	7F212A	CT-77	16T244BS	CT-130
2T214BS-1	CT-129	7H214	CT-121	16T244BS-1	CT-131
2T214B-1	CT-108	7H214B	CT-121	16T244ES	CT-130
2T214D	CT-115	7H214B-1	CT-123	16T244ES-1	CT-131
2T214D-1	CT-116	7H214D	CT-115	16T244M	CT-95
2T214MD	CT-115	7H214D-1	CT-116	16T244MS	CT-130
2T214MD-1	CT-116	7H214M	CT-121	16T244MS-1	CT-131
2T214MS	CT-128	7H214M-1	CT-123	16T244M-1	CT-112
2T214MS-1	CT-129	7H214-1	CT-123	16T244S	CT-130
2T214M-1	CT-108	8F212A	CT-77	16T244S-1	CT-131
2T214S	CT-128	9F212A	CT-77	16T244-1	CT-112
2T214S-1	CT-129	9F214	CT-121	18W214FD-1	CT-134
2T214-1	CT-108	9F214BD	CT-115	19C214M	CT-143
3C212A	CT-77	9F214BD-1	CT-116	19C214MD	CT-145
3C212MG	CT-77	9F214MD	CT-115	19C214MD-1	CT-146
3C213	CT-77	9F214MD-1	CT-116	19C214M-1	CT-144
4C174	CT-99	9F214-1	CT-123	21T214ES	CT-143
4C174MD	CT-99	11F244	CT-95	21T214ES-1	CT-144
4C174M-1	CT-110	11F244B	CT-95	23C214B	CT-143
4C174MS-1	CT-110	11F244B-1	CT-112	23C214B-1	CT-144
4C174-1	CT-110	11F244M	CT-95	23C214M	CT-143
4H212A	CT-77	11F244M-1	CT-112	23C214M-1	CT-144
4T213	CT-77				

CAPEHART CHASSIS CT-75, CT-77, CT-81, CT-95, CT-99, CT-108, CT-110, CT-112, CT-115, CT-116, CT-121, CT-122, CT-123, CT-124, CT-126, CT-127, CT-128, CT-129, CT-130, CT-131, CT-134, CT-143, CT-144, CT-145, CT-146 (Ch. Series CX-37, CX-37R, CX-37-1).

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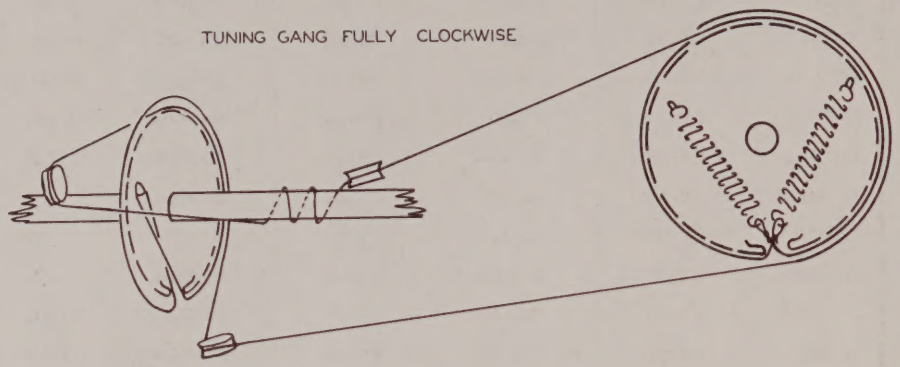
Ch. Series CX-37-1

Chassis Series CX-37-1 includes a UHF tuner (part no. 750445). When the UHF tuner is used the VHF tuner is changed to part no. 850270. Models using the UHF tuner are identified by the -1 suffix to the model number.

A partial schematic, showing the UHF tuner and the new VHF tuner, is shown in Fig. 1 on next page. In addition, when these tuners are used, a 1000MMF capacitor is added, in series, with the lead from L13 to pin 1 (grid) of the 1st. video IF amplifier (V3) and R117 and R118, in the low voltage power supply, are replaced by two 33KΩ, 2 watt resistors, connected in parallel.

UHF Dial Cord stringing instructions are given in Fig. 2 below.



UHF DIAL CORD STRINGING

FIG. 2

Ch. Series CX-37R

Chassis Series CX-37R and CX-37R-1 are identical to Chassis Series CX-37 and CX-37-1, except the front panel controls were regrouped and a TV-Phono Tone switch were added. When TV-Phono Tone switch is used the TV-Phono switch is no longer attached to the contrast control. A partial schematic is given in Fig. 3 below, which shows the new TV-Phono Tone switch circuit.

A list of the new part numbers of the controls involved in the front panel re-grouping is given below.

PART NO.	DESCRIPTION
453465A-1	Volume - Contrast Control
453467A-1	Shading Control
453466A-1	Vertical Hold Control
650692A-1	TV-Phono Tone Switch

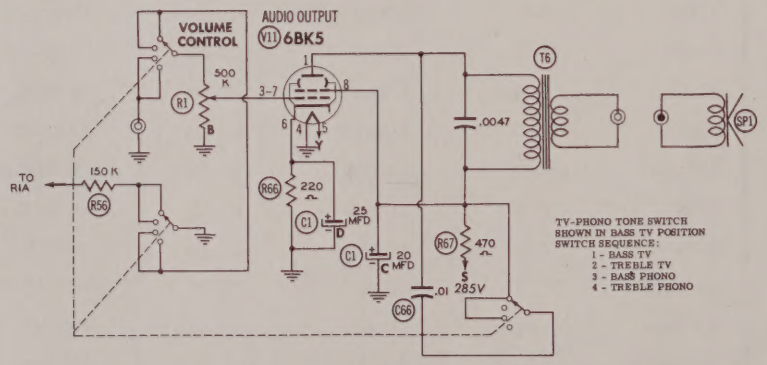


FIG. 3

Ch. Series CX-37, -1 (Modified for 24" & 27")

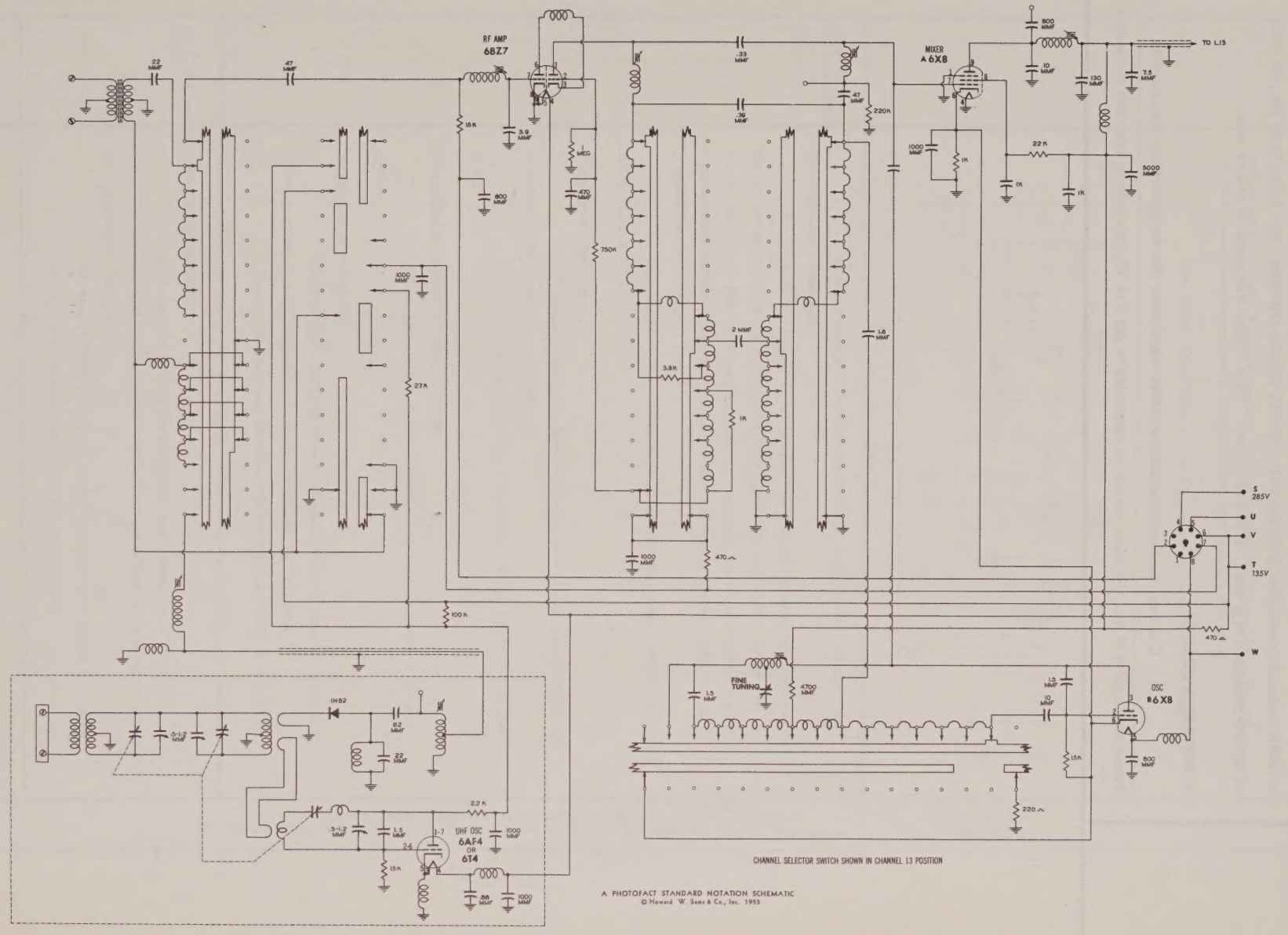
Chassis CT-95, CT-112, CT-130 and CT-131 are 24" and 27" (24CP4, 27GP4) versions of the CX-37, -1 series chassis. A list of the modifications made to accommodate the larger tubes is given below.

HORIZONTAL OUTPUT CIRCUIT REVISED

The horizontal output circuit was revised as follows in order to accommodate the larger tube.

The horizontal output transformer (T2) was changed to part no. 850274B-1.

The width coil (T5) was changed to part no. 650746A-1.



CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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FIG. 1

A horizontal linearity coil (part no. 650745A-1) was added to the chassis.

The deflection yoke and plug assembly (T4) was changed to part no. 850273A-1.

The horizontal output tube (V17) was changed to a type 6CD6G.

The damper tube (V18) was replaced by two type 6AX4GT tubes.

A partial schematic showing the revised circuit is given in Fig. 4.

VERTICAL OUTPUT CIRCUIT REVISED

The vertical output tube was changed to a type 6AV5GT and vertical output transformer was changed to part no. 750398A-1.

The vertical linearity control (R7) was changed to 2KΩ and a 270KΩ resistor was added in series with the control to ground.

A partial schematic showing the revised vertical output circuit is given in Fig. 4.

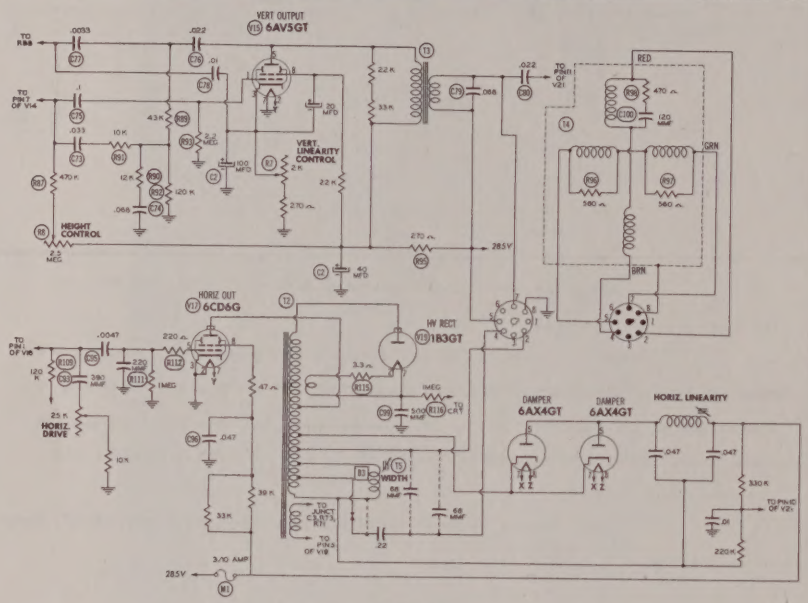

FIG. 4

LOW VOLTAGE SUPPLY REVISED

An additional 5U4G, low voltage rectifier tube, was added to the chassis.

A partial schematic is given in Fig. 5, which shows this revised circuit. The power transformer (T1) was changed to part no. 750395B-3. The filter choke was changed to part no. 650745A-1.

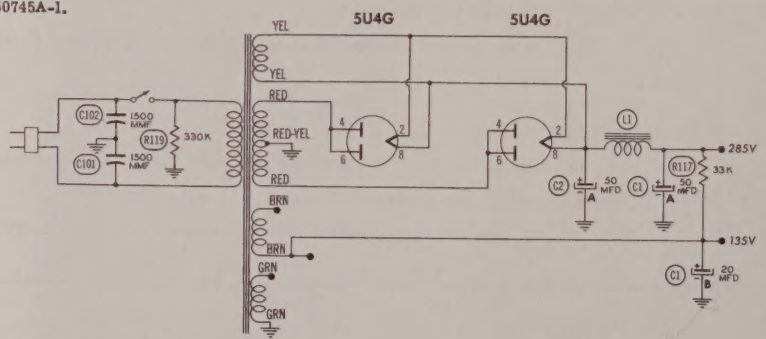

FIG. 5

CONTROLS CHANGED

The front horizontal hold control was changed to 25KΩ and connected as shown in Fig. 6.

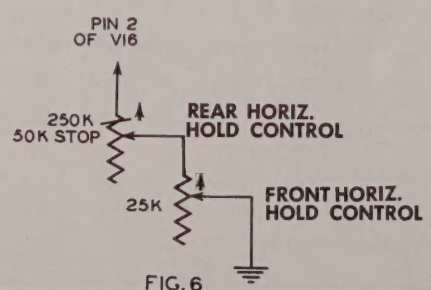

FIG. 6

CAPEHART CHASSIS CT-75, CT-77, CT-81, CT-85, CT-99, CT-108, CT-110, CT-112, CT-115, CT-116, CT-121, CT-122, CT-123, CT-124, CT-126, CT-127, CT-128, CT-129, CT-130, CT-131, CT-134, CT-143, CT-144, CT-145, CT-146 (Ch. Series CX-37, CX-37R, CX-37-1).

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The shading control was changed to part no. 453599A-1. This control contains the TV-Phono switch which formerly was on the contrast control. The contrast control was combined with the volume control and on-off switch. The part no. for this control is 650749A-1.

In addition, in Chassis CT-130 and CT-131, a 6AQ5 audio output tube and a 6AV6 audio amplifier are used. A partial schematic, showing this circuit, is given in Fig. 7. The part no. for the new audio output transformer is 650216A-2 and the tone control is 750266A-7.

When the 24" and 27" tubes are used the Ion trap is changed to part no. 650276A-5 and the focus magnet assembly is changed to part no. 750449A-1.

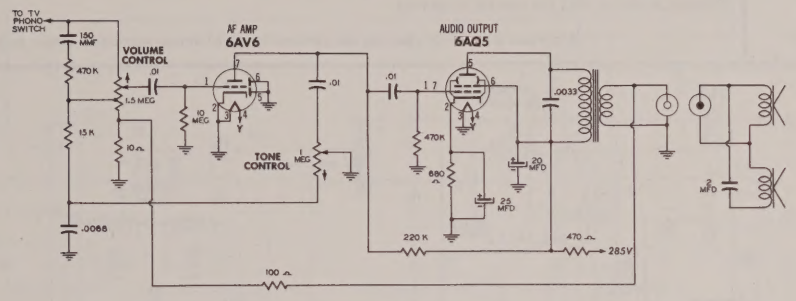

FIG. 7

Ch. Series CX-37, CX-37R, CX-37-1, CX-37R-1

In later production of Capehart chassis series CX-37, CX-37R, CX-37-1, the following changes were made.

Production changes in Capehart television receivers are coded by stamping on the chassis rear apron, the chassis series number and the production code number. For example, a chassis stamped CX-37R "R1 D1" uses the CX-37 series chassis, with the controls regrouped as explained above and incorporates all production changes in the RF, IF chassis, coded R1, and deflection chassis, coded D1 .

Photofact Folder 4 — Set 203 includes all production changes coded R2, D2; except for the following.

COMPONENT CHANGES

C101 and C102, connected across the AC input, were changed from 1500MMF, 500V to 1500MMF, 1500V units (part no. 453521A-2).

C99, high voltage filter capacitor, was returned to ground instead of to the plate of V18.

TO ELIMINATE 120 CYCLE HUM IN PICTURE

C30 was removed from pin 7 of V4 and reconnected from terminal C of L14 to ground.

TO REDUCE HUM IN SOUND

C1A (50MFD) and C2A (50MFD) were transposed with C2A connected from pin 8 of V20, to ground, and C1A connected from the junction of L1 and R117 to ground.

C66, parasitic suppressor capacitor, was changed from .01MFD to .0047MFD.

Ch. Coded R2 D3

SYNC CIRCUIT REVISED

R80, connected from pin 7 of V13 to 285V, was deleted.

C69, sync coupling capacitor, was omitted and the plate (pin 5) of V12 was connected directly to the grid (pin 7) of V13.

C67, connected from pin 7 of V12, to R47, as changed from .01MFD to .047MFD.

R77, V12 screen resistor, was reduced from 39KΩ to 22KΩ.

Ch. coded R2 D4

V12 TUBE TYPE CHANGED

V12 was changed from a type 6BE6 to a type 6CS6 tube. No circuit changes were made when this change was made.

CAPEHART CHASSIS CT-75, CT-77, CT-81, CT-95, CT-99, CT-108, CT-110, CT-112, CT-115, CT-116, CT-121, CT-122, CT-123, CT-124, CT-126, CT-127, CT-128, CT-129, CT-130, CT-131, CT-134, CT-143, CT-144, CT-145, CT-146 (Ch. Series CX-37, CX-37R, CX-37-1).

Ch. coded R3 D4	AUDIO DETECTOR CIRCUIT REVISED The 330KΩ, 6BN6 plate load resistor (R63), was replaced by a 220KΩ and a 120KΩ resistor, connected in series and a .1MFD, bypass capacitor, was added from the junction of the two resistors to ground. R59 was deleted. This change was made to reduce hum. COMPONENT CHANGE C41 was replaced by a dual 1000MMF capacitor. One section of this capacitor is connected to pin 4 of V6, the other section is connected to pin 3 of V6, common is returned to chassis.

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AIRLINE
MODEL 61-6788

AIRLINE
MODEL 61-6788

TRADE NAME	Airline Model 61-6788 (For 1952 & 1953 Ford Automobiles)
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Ill.
TYPE SET	Battery Operated Custom Built Automobile AM Superheterodyne Receiver
TUBES (Seven)	Types 6BA6 RF Amp., 6BE6 Conv., 6BA6 IF Amp., 6AV6 Det.-AVC-AF Amp., 6V6GT Output, 6AU6 Trigger Amp., 6X5GT Rectifier
POWER SUPPLY	6 Volt Storage Battery — RATING 5.6 Amp. @ 6.3 Volts DC
TUNING RANGE—BROADCAST	538-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Set volume control for maximum volume.
Attenuate generator output to maintain 1.8 volts (1 watt) on output meter.
Use insulated alignment tool.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	455KC (400~Mod)	High frequency end stop	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	1620KC	"	"	A5	"
3.	68MMF	High side to antenna receptacle. Low side to chassis.	1400KC	Tune to 1400KC signal	"	A6, A7	"
4.	With radio installed in car and antenna fully extended tune in a station near 1400KC and adjust A7 for maximum volume.						

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		AIRLINE PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BA6	6BA6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amplifier	6BA6	6BA6	7BK	
V4	Det.-AVC-AF Amp.	6AV6	6AV6	7BT	6AT6 used in some sets
V5	Output	6V6GT	6V6GT	7S	
V6	Trigger	6AU6	6AU6	7BK	
V7	Rectifier	6X5GT	6X5GT	6S	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	AIRLINE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	20	350	CE-86	AFH3-107		C080		FP227	TVL-3739	
B	20	350						TC26		
C	20	25								
C2	100		CC101	SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C3	22		CC220	SI22	D6-220	TP22	GP1K-220	UC-5422	5GA-Q22	
C4	.05	200	C503-2	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C5	5		CC47	SI5	D6-050	G011	GP1K-050	ZT-555	5GA-V5	
C6	47	500	CM470	1468-00005		5W5Q47		MCB225	MS-45	
C7	20			SI20NP0	TCZ-20	TZ13	NP0K-220	ZT-542	5TCC-Q2	
C8	75									
C9	.047	200	C503-2	P288-047	DF-503	PJ2S47		PT4147	2TM-S47	
C10	200		CC201	SI200	D6-201	TP38	GP1K-201	UC-532	5GA-T2	
C11	.01	600	C103-6	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C12	200		CC201	SI200	D6-201	TP38	GP1K-201	UC-532	5GA-T2	
C13	.01	600	C103-6	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C14	.005	400	C502-4	P688-005	D6-502	CUB6D5	GP2-333-502	PT625	6TM-D5	
C15	.01	600	C103-6	P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C16	.5	100	C504-1	VHC-36		PJ2P5		RF480	HC-2	
C17	.05	200	C503-2	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C18	.01	600		P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	Note 1
C19	.5	100	C504-1	VHC-36		PJ2P5		RF480	HC-2	
C20	.008	1600	C802-16	P1688-008		CUB16D8		PT1628	MB-D8	

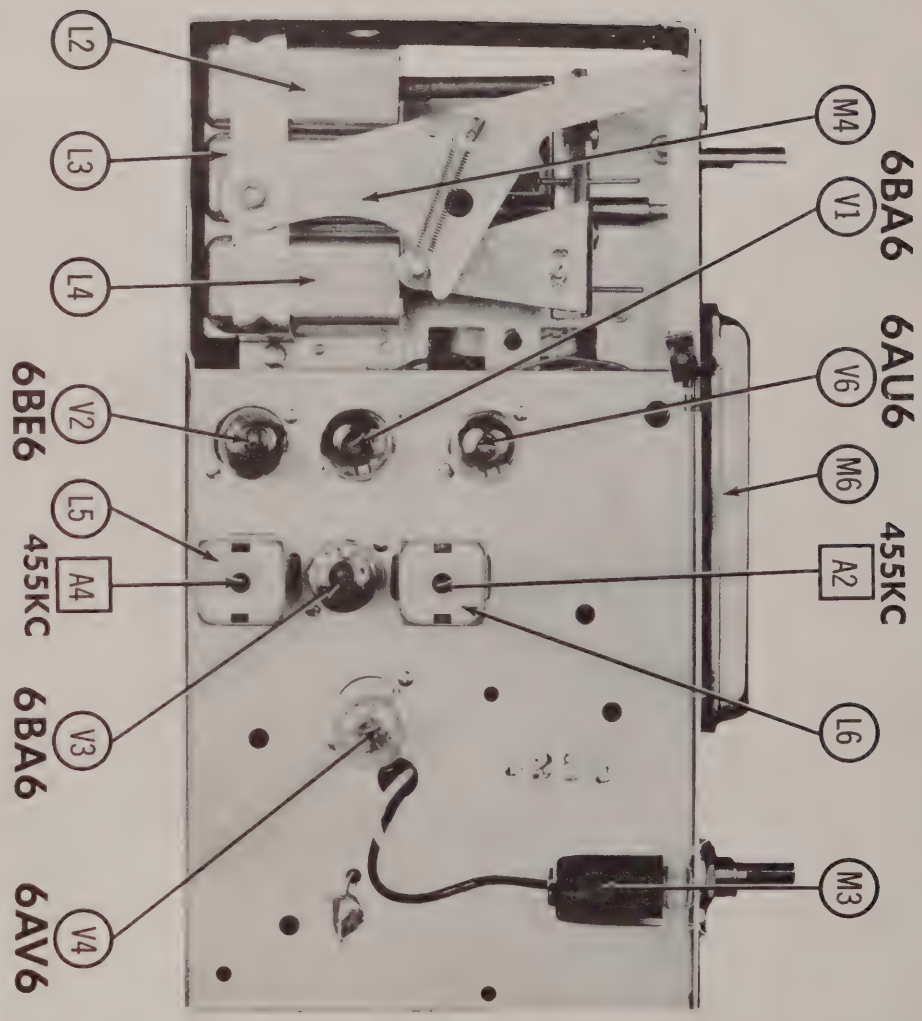
Note 1. Not used in all models.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	AIRLINE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	750KΩ with 20KΩ stop	½	RV-100	Q13-137	A47-750K-Z	R-70-S	U-51	Volume - note
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-20	Not Req.	US-26	Attach to R1A

Note. Connect a 20KΩ resistor in series with the left hand terminal of the control and the lead connecting to the same terminal of the original control (control viewed from shaft end, terminals down).

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	AIRLINE PART No.	IRC PART No.	
R2	470KΩ	½	R474	BTS-470K	
R3	270Ω	½	R271	BTS-270	
R4	10KΩ	½	R103	BTS-10K	
R5	22KΩ	½		BTS-22K	Note 1
R6	1500Ω	½	R152	BTS-1500	
R7	22KΩ	2	R223-2	BTB-22K	
R8	2.2Meg	½		BTS-2.2Meg	Note 2
R9	10Meg	½	R106	BTS-10Meg	
R10	270KΩ	½		BTS-270K	Note 3
R11	330Ω	½	R331	BTS-330	
R12	470KΩ	½	R474	BTS-470K	Note 4
R13	470KΩ	½	R474	BTS-470K	
R14	270KΩ	½		BTS-270	Note 3
R15	8200Ω	1	R822-1	BTA-8200	
R16	82Ω	½	R820	BTS-82	
R17	1000Ω	1	R102-1	BTA-1000	
R18	100Ω	½	R101	BTS-100	
R19	100Ω	½	R101	BTS-100	

Note 1. Some models may use a 47KΩ resistor in this application.
Note 2. Some models may use a 2Meg resistor in this application.
Note 3. Some models may use a 250KΩ resistor in this application.
Note 4. Some models may use a 500KΩ resistor in this application.

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	AIRLINE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	6.3VCT @2A	430VCT .046ADC			TV-100		P-2971	V-16K		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	AIRLINE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T2	5.1KΩ	3.2Ω	Part of spkr.	A-3877	A-2930	S-3X	Z1001	24S51	

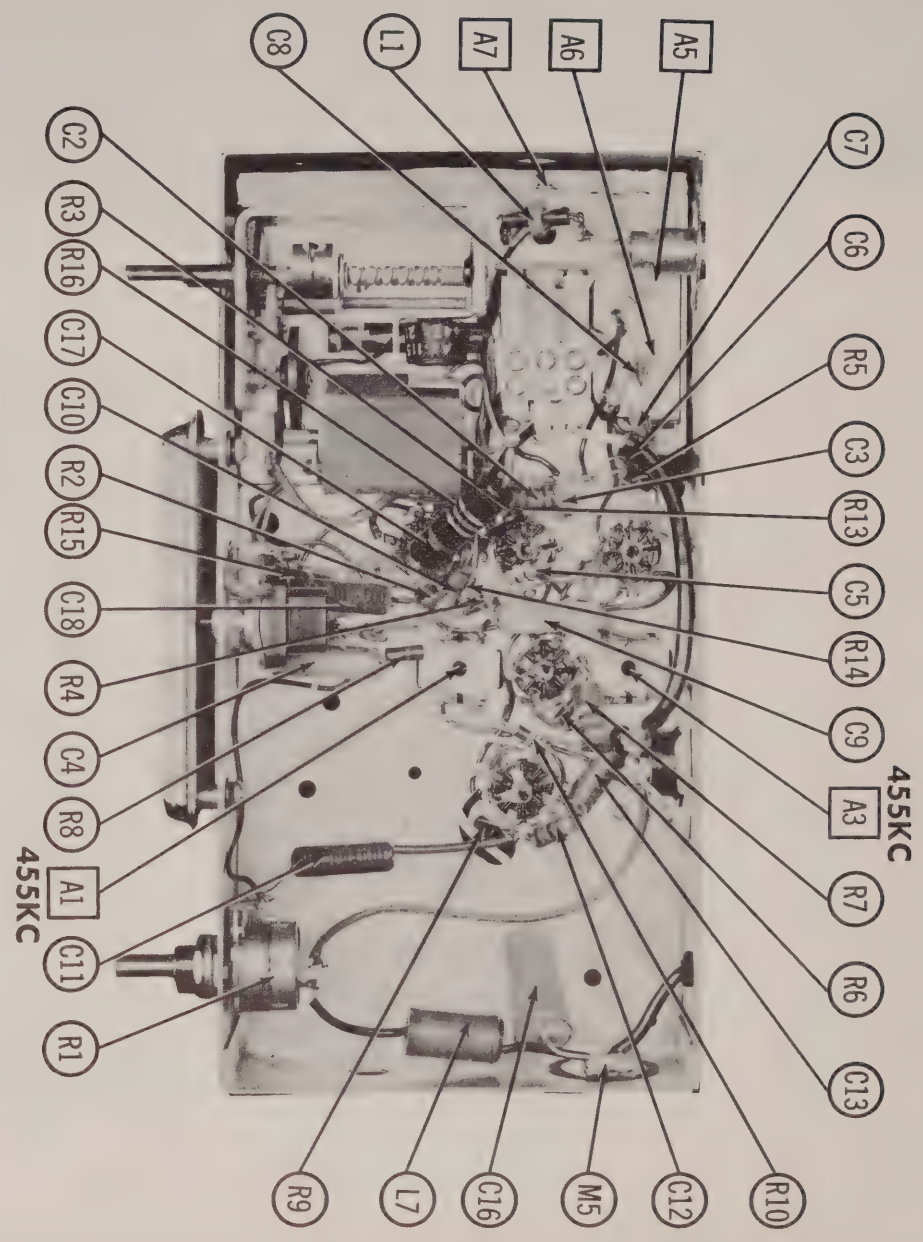
SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	AIRLINE PART No.	JENSEN PART No.	QUAM PART No.	
SP1	5 1/4"	PM	3.2Ω		ST-803 Mod. P525-V	52A1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	AIRLINE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. RF Choke	.7Ω		L352	19-1004		4610	
L2	Ant. Coil	13Ω						Part of tuning unit (TU-1001)
L3	RF Coil	12Ω						Part of tuning unit (TU-1001)
L4	Osc. Coil	1Ω	6.5Ω					Part of tuning unit (TU-1001)
L5	Input IF	17Ω	17Ω	1655-16	16-6758	BC-352	12-C1	
L6	Output IF	18Ω	18Ω	1655-16	16-6758	BC-353	12-C1	
L7	Fil. Choke	0Ω		L203		BC-537	5221	
L8	Vib. Hash Choke	0Ω		L202		BC-537	5521	

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				AIRLINE PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	6.3V	115∿	V-83 V-94 ①	5301	859	5301	① Alternate vibrator

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			AIRLINE PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	SFE	14A	A201	A300	307014 (14A-SFE)	155014	SFE-14	HDI

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M3	Dial Light	T47	Bayonet #51
M4	Tuning Unit	TU-1001	Permeability(complete with motor, relay, solenoid, etc.)
M5	Spark Plate		
M6	Switch	SP-1	Push button, station selector
M7	Switch	SS-1	Tone
A7	Trimmer Cap.	TU1000-8	Ant. Adj.
	Knob	H310E	On/off/volume
	Knob	H310E	Tuning
	Dial Scale	D153	
	Dial Pointer	PS153	
	Motor	TU1000-2	Tuning drive
	Relay	TU1000-4	
	Solenoid	TU1000-3	Motor actuator

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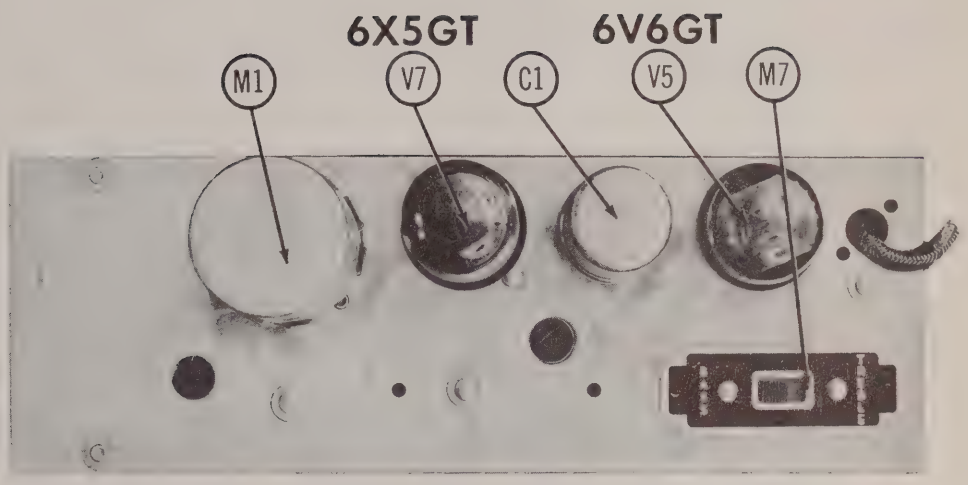

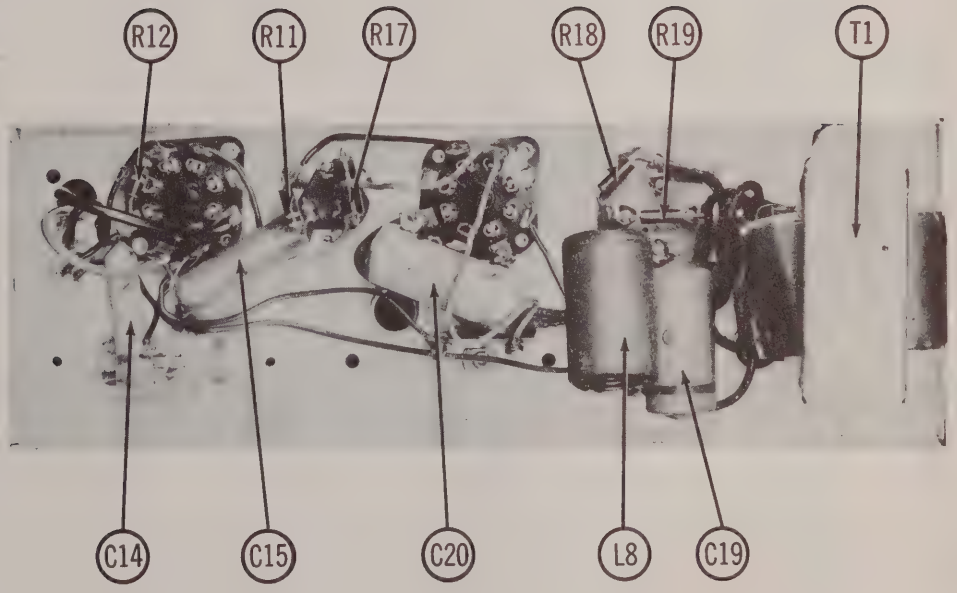

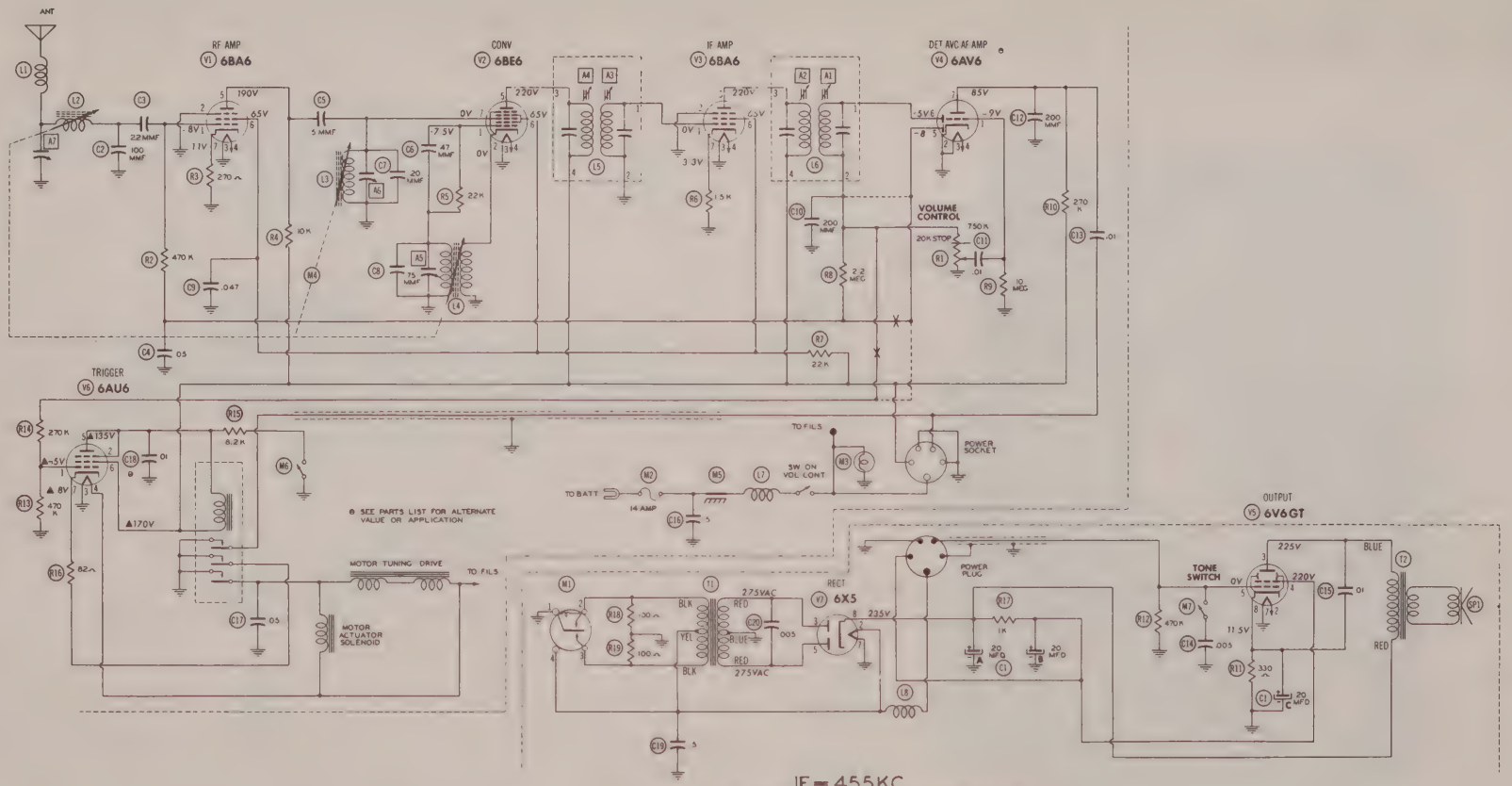

IF = 455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6BA6	3Meg	0Ω	0Ω	.1Ω	†1MΩ	†22KΩ	220Ω	
V 2	6BE6	22KΩ	1Ω	0Ω	.1Ω	†1KΩ	†22KΩ	12Ω	
V 3	6BA6	17Ω	0Ω	0Ω	.1Ω	†1KΩ	†22KΩ	1.5KΩ	
V 4	6AV6	10Meg	0Ω	0Ω	.1Ω	2.3Meg	450KΩ	†270KΩ	
V 5	6V6GT	INF	.1Ω	†395Ω	†1KΩ	470KΩ	INF	0Ω	330Ω
V 6	6AU6	470KΩ	▲5.5KΩ	0Ω	.1Ω	†5KΩ	†1KΩ	▲82Ω	
V 7	6X5	INF	.1Ω	380Ω	INF	350Ω	INF	0Ω	40KΩ

▲ TAKEN WITH STATION SELECTOR SWITCH PUSHED IN.
† MEASURED FROM PIN 8 OF V7

1 DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt
2 Socket connections are shown as bottom views
3 Measured values are from socket pin to common negative
4 Battery voltage maintained at 6.3 volts for voltage readings.
5 Nominal tolerance on components values makes possible a variation of ± 10% in voltage and resistance readings
6 Volume control at maximum, no signal applied for voltage measurements

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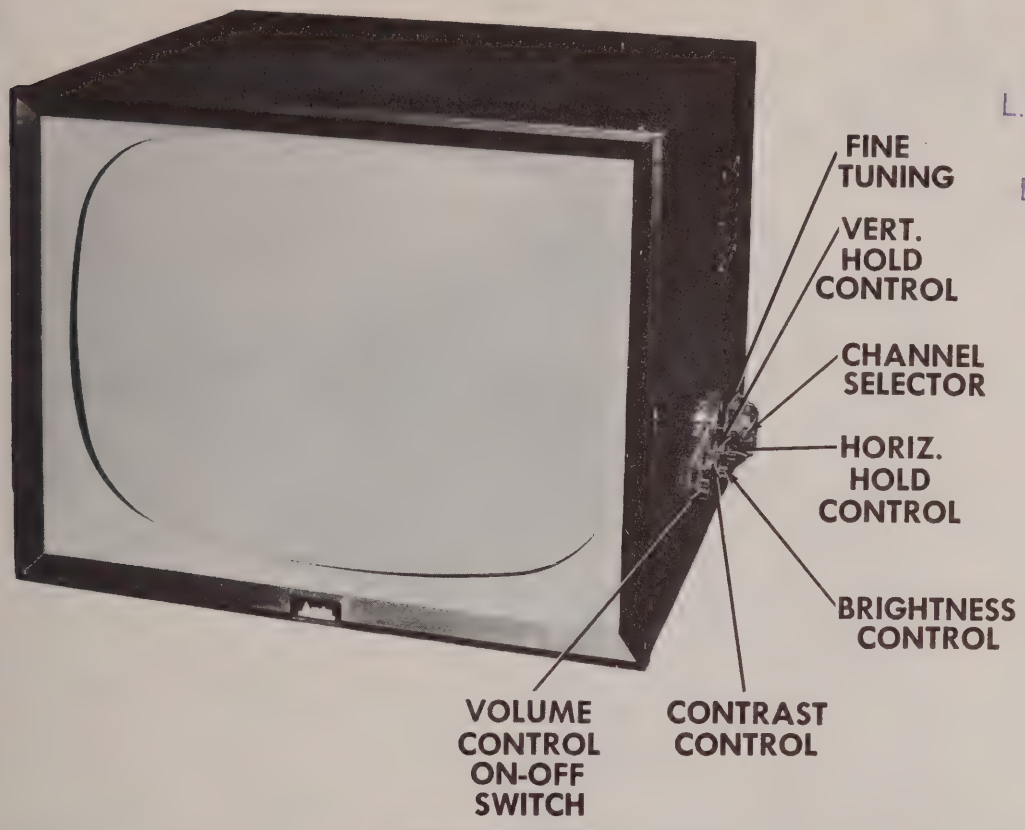

ARVIN MODEL 21-555TM

TRADE NAME	Arvin	MODELS	CHASSIS
		21-554KM, 21-555TG, 21-555TM, 21-557TM.	TE-383 "E"
		21-554KMU, 21-555TGU, 21-555TMU, 21-557TMU.	TE-386-UHF "E"
MANUFACTURER	Arvin Industries, Columbus, Indiana		
TYPE SET	Television Receiver		
TUBES	Fifteen		
POWER SUPPLY	110-120 Volts AC-60 Cycles	RATING 1.08 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

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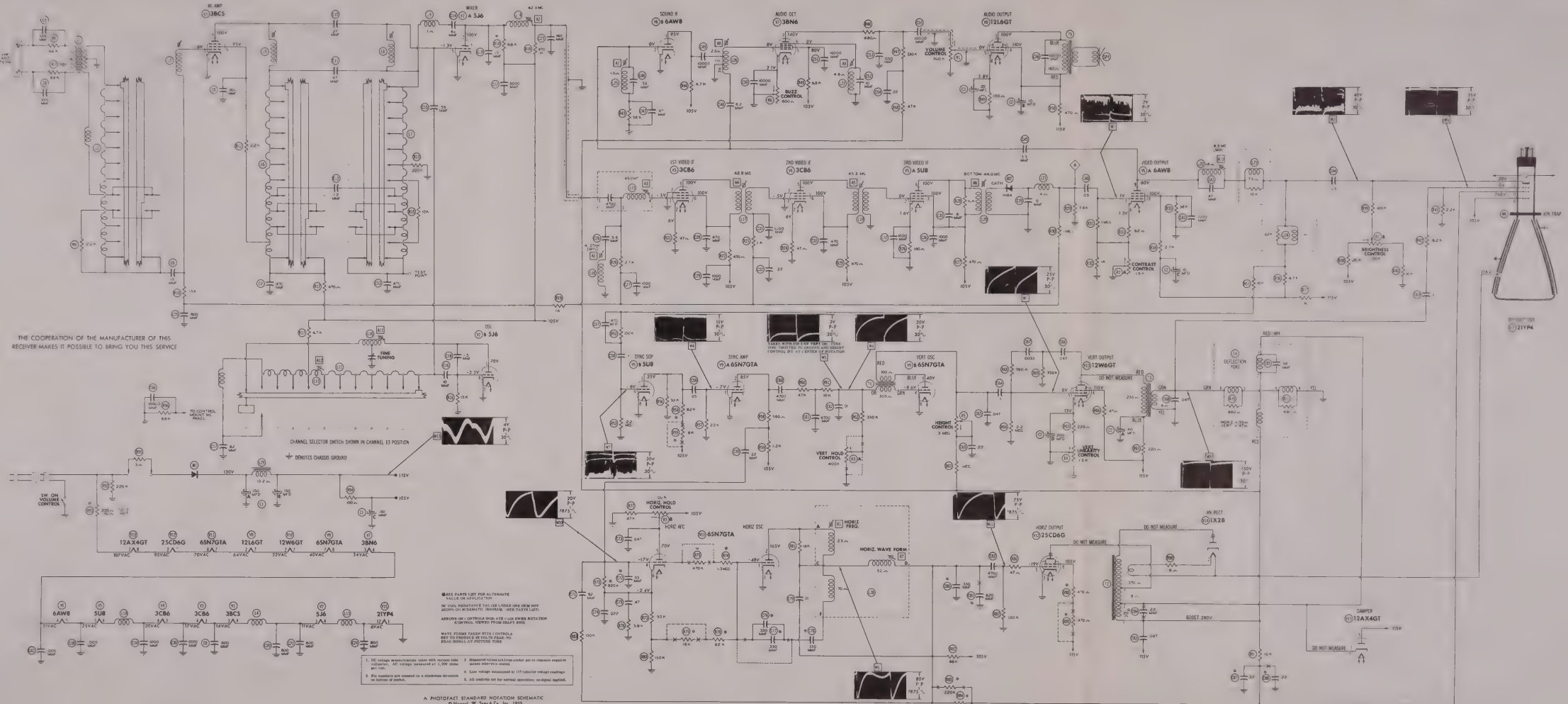
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
DENOTES CHASSIS GROUND
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
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CHASSIS TOP VIEW

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CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

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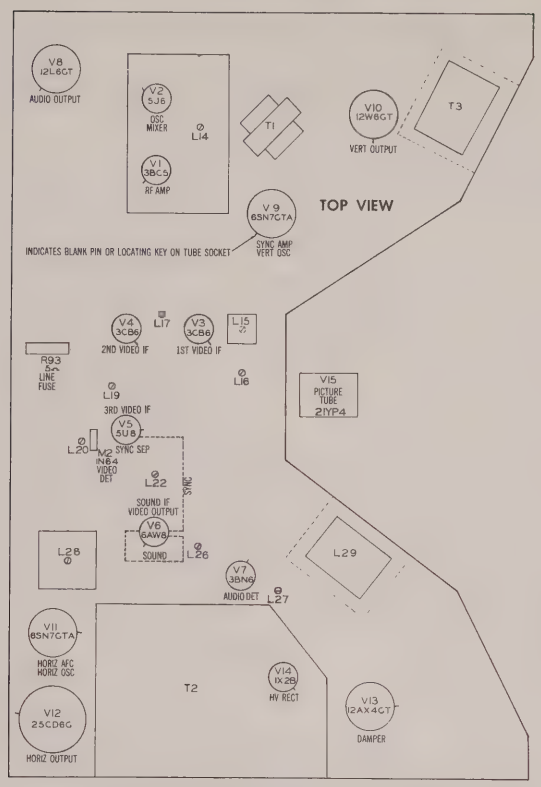
TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

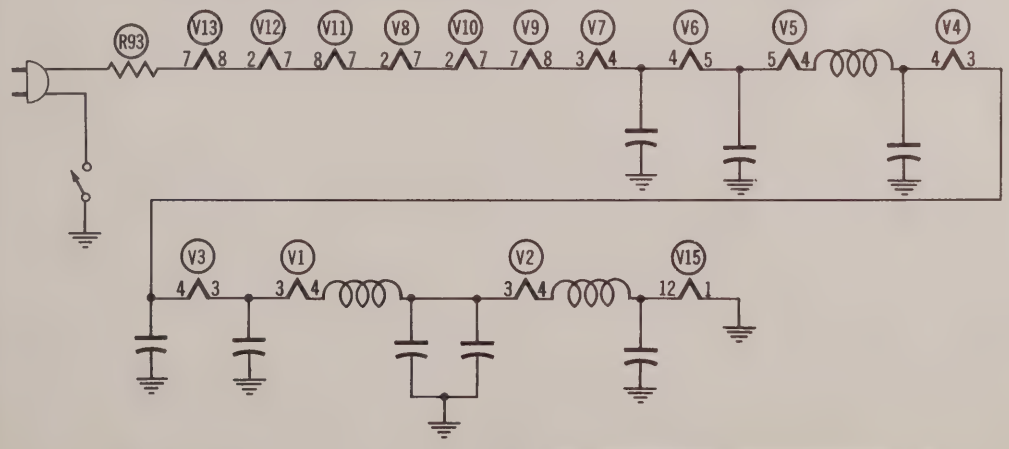
POWER SUPPLY FAILURE
No raster, no sound - **Selenium Rectifier (M1)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V2, V3, V4, V5, V6**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V6, V15**
Has pic, no sound - **V6, V7, V8**

SYNC FAILURE
No vert. sync - **V9**
No horiz. sync - **V9, V11**
No vert. or horiz. sync - **V5, V9**

SWEEP FAILURE
No raster, has sound - **V11, V12, V13, V14, V15**
No vertical deflection - **V9, V10**
Poor vert. linearity or foldover - **V9, V10**
Poor horiz. linearity or foldover - **V11, V12, V13**
Narrow picture - **V11, V12, V13, V14, M1**
Vert. off freq. - **V9**
Horiz. off freq. - **V9, V11**

NOTE: Since this receiver employs tubes used in series filament network, an open filament in any tube in series may cause the set to be inoperative. (See circuit below).



ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use an isolation transformer to protect the test equipment.
The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube (V11) to disable the high voltage.

VIDEO IF ALIGNMENT

Connect the ends of a 1000Ω potentiometer across a 4.5 volt battery. Connect the potentiometer arm to the ungrounded side of C32. Connect the positive side to chassis. Adjust the potentiometer arm for -2 volts at C32.
Attenuate signal generator output to maintain not more than -3 volts at VTVM.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over converter tube (V2). Low side to chassis.	41.25MC (Unmod)	9, 10 or 11	DC probe thru 18KΩ to point (A). Common to chassis.	A1	Adjust for MINIMUM deflection.
2.	"	"	42.9MC	"	"	A2	Adjust for maximum deflection.
3.	"	"	45.0MC	"	"	A3	Adjust for maximum deflection. Repeat steps 2 and 3.
4.	"	"	42.9MC	"	"	A4	Adjust for maximum deflection.
5.	"	"	45.3MC	"	"	A5	"
6.	"	"	44.0MC	"	"	A6	Adjust for maximum deflection. Repeat steps 4, 5 and 6.

OVERALL VIDEO IF RESPONSE CHECK

Restore shield over converter tube to its normal position.
Connect the high side of RF signal generator to chassis near V3 to provide markers. Leave the low side disconnected.
Increase the bias at the ungrounded side of C32 from -2 volts to -2.5 volts.
Use only enough sweep and marker generator output to provide usable indication on scope.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	195MC (10MC Swp)	41.25MC 42.75MC 45.0MC 45.75MC	10	Vert. Amp. thru decoupling filter (Fig.1) to point (A).		Check for response curve similar to Fig.2. If necessary, SLIGHTLY retouch A2 thru A6 to obtain desired response. A4 positions 42.75MC marker, A5 positions 45.75MC marker, and A6 adjusts tilt of response curve.

SOUND IF ALIGNMENT

Remove the bias battery and tune in a TV station. Reduce signal input to receiver until hiss is heard with the sound. The signal input may be reduced by inserting an attenuator pad in series with the antenna lead-in and the antenna terminals. If an attenuator pad is not available, disconnect the antenna lead-in and stray feed the signal by placing the lead-in near the antenna terminals.
Set the buzz control (R6) to its mid-range position. Adjust A7, A8 and A9 for clearest sound and minimum buzz. If the hiss should disappear during adjustment, reduce the signal input until the hiss returns.

SOUND IF ALIGNMENT USING ON THE AIR SIGNAL AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	Not used	Not used	Not used	Tune in any local channel	Thru detector (Fig.3) to pin 2 (grid) of 6BN6 (V7).	A7, A8	Adjust for maximum deflection.
9.	"	"	"	"	"	A9	Set buzz control (R6) to its mid-range position. Adjust A9 for maximum sound. Readjust R6 for MINIMUM buzz. Correct adjustment of R6 should occur near its mid-range position.

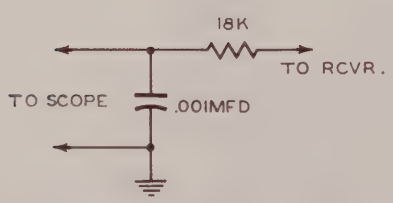


FIG. 1

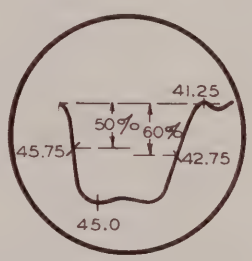


FIG. 2

ALIGNMENT INSTRUCTIONS (cont)

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4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.01MFD	High side to pin 7 (grid) of 6AW8 (V6). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	Thru detector (Fig. 3) to pin 11 (cathode) of picture tube.	A10	Adjust for MINIMUM deflection.

OSCILLATOR ALIGNMENT

Connect the bias supply as under "Overall Video IF Alignment Check".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru decoupling filter (Fig. 1) to point (A). Low side to chassis.	A11	Adjust to place sound marker in trap notch as in Fig. 4. Video marker should be at 50%.
12.	"	"	207MC (10MC Swp)	205.25MC 209.75MC	12	"		Check for sound and video marker placement as in Fig. 4. If necessary make compromise adjustment of A11 for any individual channel, then recheck all other high band channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
13.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A12	Adjust to place sound marker in trap notch as in Fig. 4. Video marker should be at 50%.
14.	"	"	79MC (10MC Swp)	77.25MC 81.75MC	5	"		Check for sound and video marker placement as in Fig. 4. If necessary, make compromise adjustment of A12 for any individual channel, then recheck all other low band channels to see that they have not been seriously affected.
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

RF AND MIXER ALIGNMENT

The RF and mixer portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion of the receiver should not be required in the field.

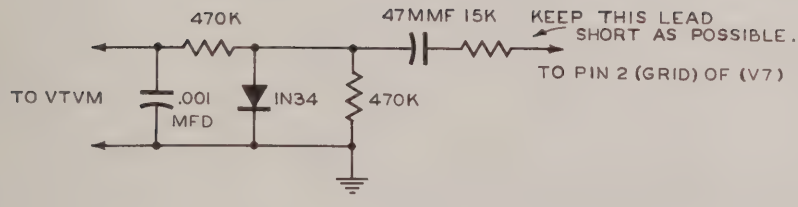


FIG. 3

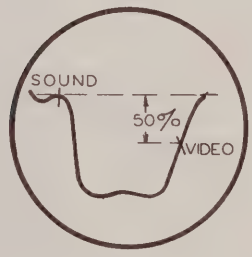
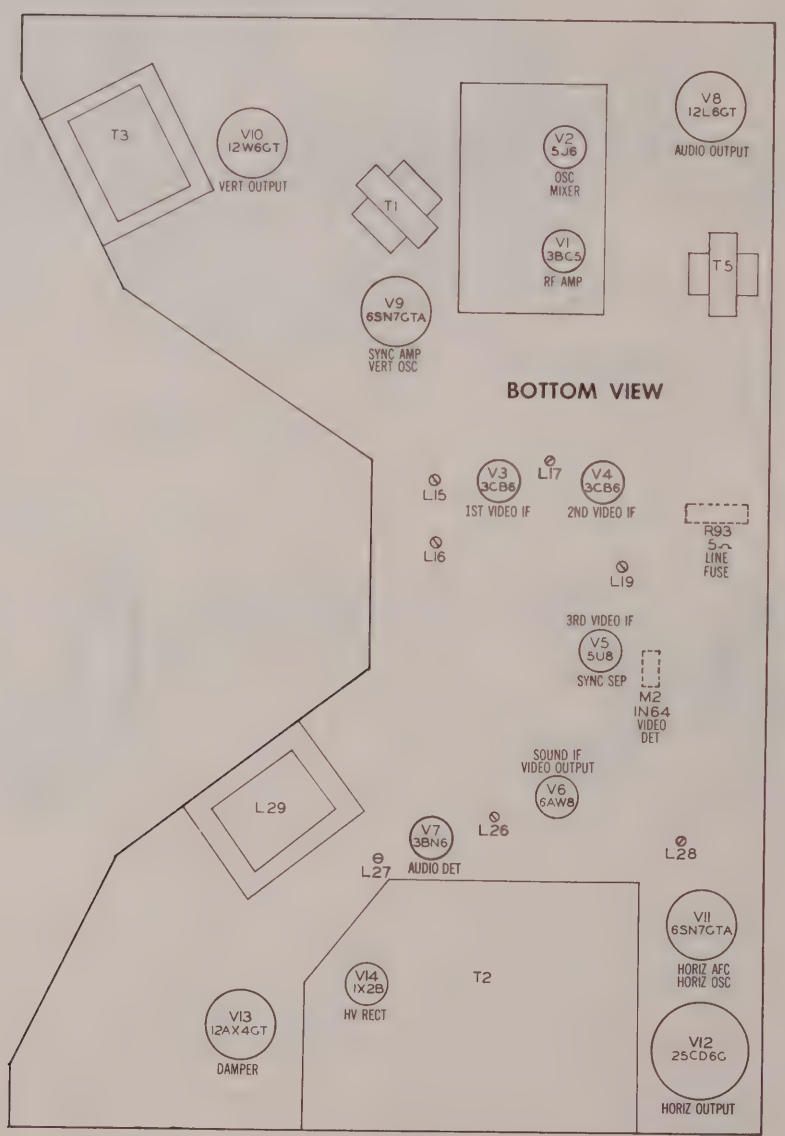


FIG. 4

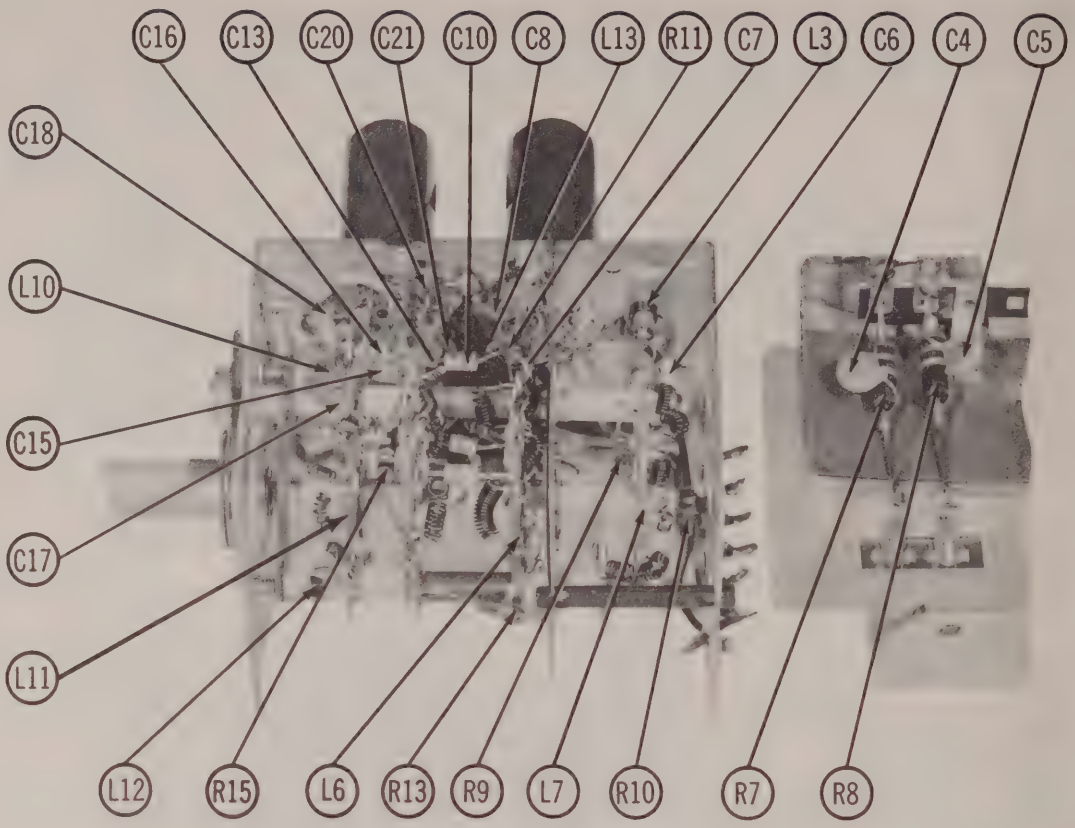
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	3BC5	1Meg	0Ω	4Ω	3Ω	†600Ω	†2. 8KΩ	0Ω		
V 2	5J6	†4. 8KΩ	†600Ω	3Ω	2Ω	220KΩ	15KΩ	0Ω		
V 3	3CB6	1Meg	47Ω	4Ω	5Ω	†600Ω	†600Ω	0Ω		
V 4	3CB6	1Meg	47Ω	5Ω	6Ω	†600Ω	†600Ω	0Ω		
V 5	5U8	†40KΩ	. 4Ω	†600Ω	6Ω	8Ω	†600Ω	180Ω	0Ω	2. 2Meg
V 6	6AW8	0Ω	56KΩ	†4. 8KΩ	10Ω	8Ω	100Ω	1Meg	†3. 7KΩ	†5. 7KΩ
V 7	3BN6	350Ω	3. 5Ω	11Ω	10Ω	†6. 9KΩ	4. 8Ω	▲450KΩ		
V 8	12L6GT	INF	18Ω	†650Ω	†470Ω	320KΩ	0Ω	16Ω	150Ω	
V 9	6SN7GTA	22KΩ	†1. 9KΩ	0Ω	650KΩ	▲3. 5Meg	0Ω	13Ω	11Ω	
V 10	12W6GT	†230Ω	16Ω	†490Ω	†60Ω	2. 2Meg	INF	13Ω	550Ω	
V 11	6SN7GTA	250KΩ	▲50KΩ	0Ω	900KΩ	†40KΩ	300KΩ	18Ω	20Ω	
V 12	25CD6G	INF	27Ω	0Ω	▲50KΩ	150KΩ	150KΩ	20Ω	†1KΩ	Top Cap ▲8Ω
V 13	12AX4GT	INF	INF	130KΩ	INF	†13Ω	INF	30Ω	27Ω	
V 14	1X2B	PINS 1 - 8 HAVE INFINITE RESISTANCE								Top Cap ▲378Ω
V 15	21YP4	0Ω	2. 2KΩ	Pin 6 †113Ω	Pin 10 ▲10KΩ	Pin 11 †100KΩ	Pin 12 2Ω			

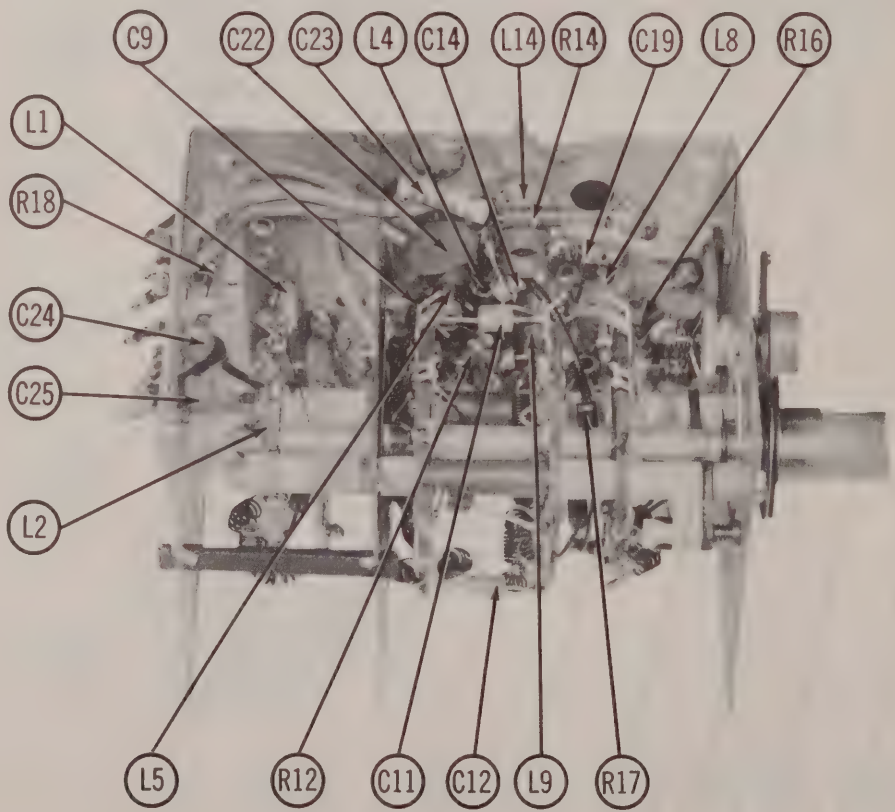
† MEASURED FROM OUTPUT OF M1.
▲ MEASURED FROM PIN 3 OF V13.



TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE

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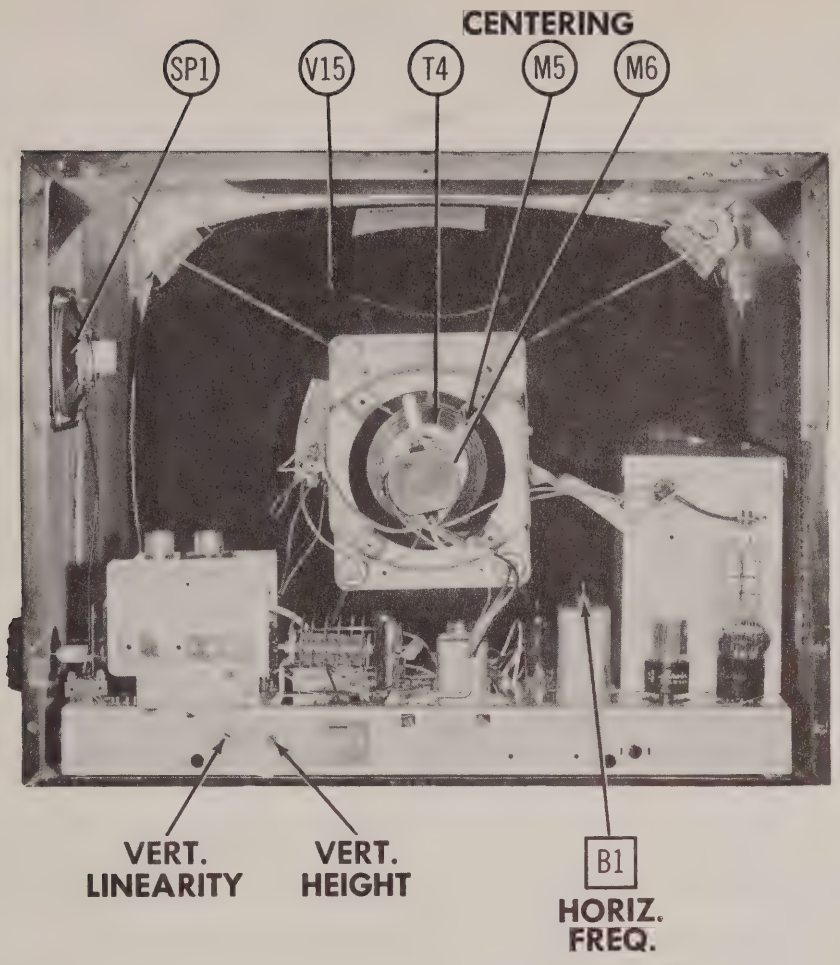


CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Turn the horizontal hold control clockwise.

Connect a short jumper from terminal "C" to terminal "D" of L28.

Adjust the horizontal frequency slug (B1) until the picture falls in sync.

Remove jumper from terminals "C" and "D" of L28.

Connect the vertical amplifier of an oscilloscope thru 10KΩ to terminal "C" of L28.

Adjust the waveform slug (B2) for a waveform similar to Fig. 5 with the broad and narrow peaks of equal height. If necessary, keep the picture in sync with B1 while making this adjustment. Remove scope.

Turn horizontal hold control fully clockwise and adjust B1 until 2 diagonal bars appear on the screen.

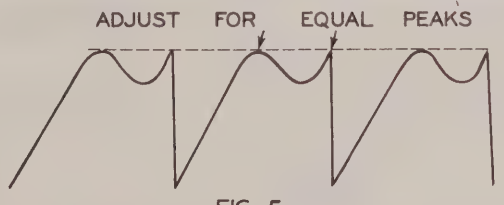


FIG. 5

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V12 and V13. Check M1. Check adjustment B2. Check C82, C80, C81, R88 and other associated components.

DRIVE LINES

Check by substitution V12 and V13. Check C80, C81, C82, R81, R88, R82 and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V12 and V13. Check horizontal output and damper stages for component failure or change of value.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V11, V12 and V13. Check C72 for open. Check L28, C79, C78, R81 and other associated components.

XMAS TREE EFFECT

Check by substitution V11, V12 and V13. Check T2 and T4A for internal arcing. Check L28, C79, C73, C78, C82, R81, R82, R3B and other associated components.

VERTICAL

LOSS OF SWEEP

Check by substitution V9 and V10. Check waveform W7.

If Satisfactory	If Unsatisfactory
Check T3, T4B, C2A, R67, R66, R65 and other associated components.	Check T1, R63, R5, C64, C63, C65 and other associated components.

INSUFFICIENT SWEEP

Check by substitution V9 and V10. Check height and vertical linearity controls for proper operation. Check T3 and T4B.

COMPRESSED AT BOTTOM

Check by substitution V9 and V10. Check T1, R63, R5, C64, C65 and other associated components.

COMPRESSED AT TOP

Check by substitution V9 and V10. Check C2D, R65, R4, T3 and other associated components.

FOLDS

Check by substitution V9 and V10. Check R65, R64, C63, T1 and other associated components.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V5 and V9. Check C57, C58, C59, R55, R54, R58, R59 and other associated components.

LOSS OF VERTICAL SYNC - HORIZONTAL SYNC SATISFACTORY

Substitute V9. Check T1, C60, C61, C62, R62, R3A and other associated components.

LOSS OF HORIZONTAL SYNC - VERTICAL SYNC SATISFACTORY

Substitute V11. Check C70, C73, R3B, R72, R77 and other associated components.

HORIZONTAL BENDING

Check by substitution V5, V9 and V11. Check horizontal AFC network.

VIDEO

LOSS OF VIDEO

Substitute V6. Check C43, C44, L23, L24, R36, R37, R34 and other associated components.

SOUND BARS (4.5MC BEAT)

Adjust tuner fine tuning for best sound and picture. Check adjustment A10. Check video IF alignment.

POOR CONTRAST

Substitute V6. Check video crystal detector. Check contrast control and picture tube. Check C43, C44, C40, L23, L24 and other associated components.

NEGATIVE PICTURE

Substitute V6. Check picture tube. Check video crystal detector network. Check C40, C2C, C43, C44, R34, L23, L24 and other associated components.

SMEAR

Substitute V6. Check C43, L23, L24 and R36. Check video IF alignment.

WIDE BLACK BAR ACROSS PICTURE

Check by substitution V1, V3, V4, V5 and V6 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V6, V7 and V8. Check stage V8 using audio signal generator. Apply audio signal across R1.

If Satisfactory	If Unsatisfactory
Check audio detector and audio IF stages for component failure or change of value.	Check C55, C56, C2B, R50, R49, T5, speaker and other associated components.

BUZZ

Adjust tuner fine tuning for best sound and picture. Check adjustments R6 and A9. If still unsatisfactory, check audio IF alignment.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

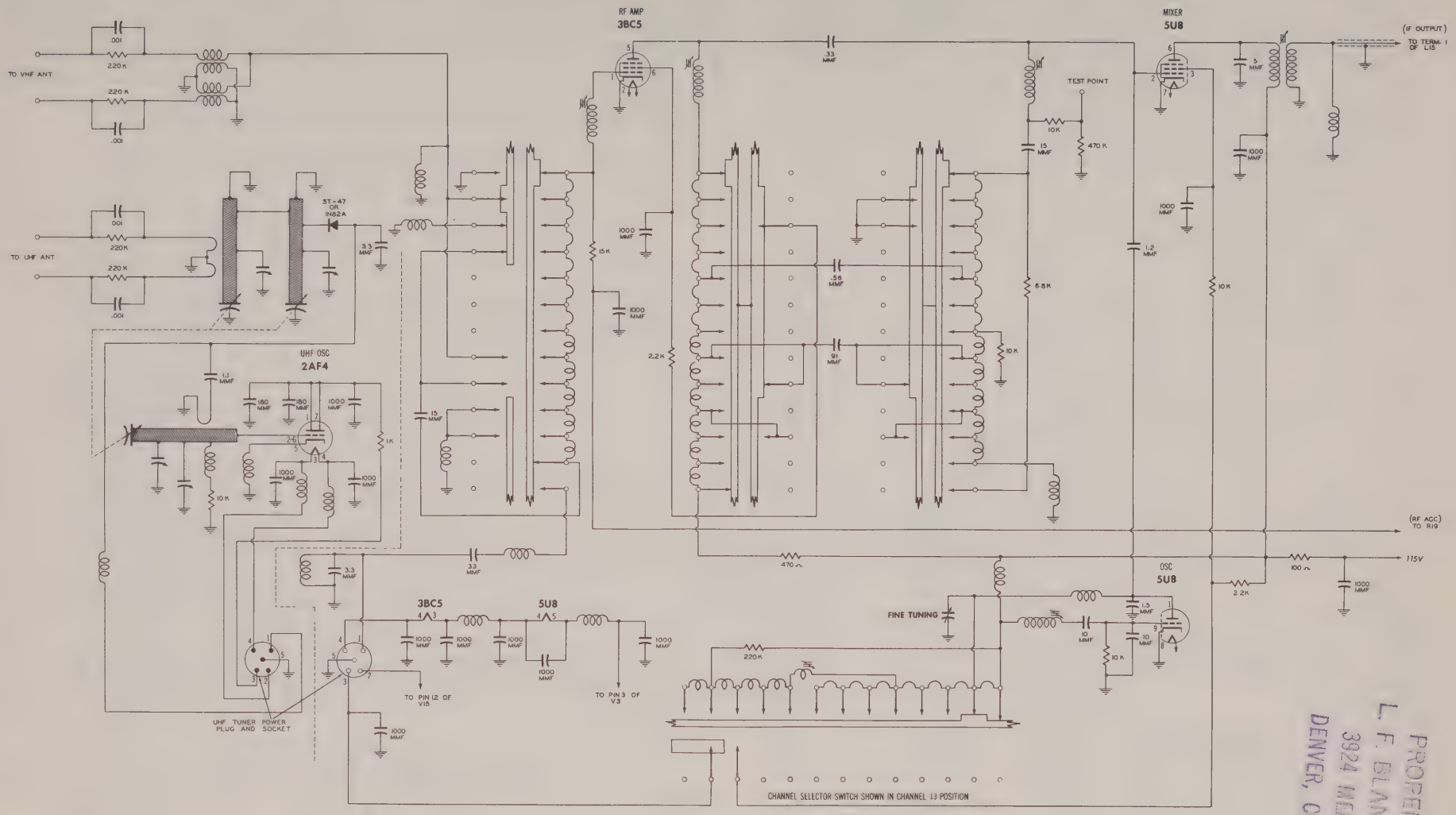
POWER

DEAD SET

If filaments fail to light, check all tubes. Tubes are connected in series. Check R93, AC interlock assembly and switch on volume control. If filaments light, check R95 and M1. Check B+ filter and decoupling network for component failure or change of value.

SMALL AND/OR DIM PICTURE

Check M1. Check R95 and R93. Check B+ filter and decoupling network.



UHF TUNER PART NO. 42893 , VHF TUNER PART NO. 42892 USED ON CHASSIS TE-383-UHF "E"

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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ALTERNATE UHF-VHF TUNER SCHEMATIC

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

ERTY OF
L. F KENSHIP
3924 MEADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: ARVIN PART No.	STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	RF Amp.	5BC8	5BC8	7BD	
V2	Mixer-Osc.	5J6	5J6	7BF	
V3	1st Video IF Amp.	5CB6	5CB6	7CM	
V4	2nd Video IF Amp.	5CB6	5CB6	7CM	
V5	3rd Video IF Amp. Sync Sep.	6U8	6U8	9AE	
V6	Video Output-Sound IF Amp.	6AW8	6AW8	9DX	
V7	Audio Det.	5BN6	5BN6	7DF	
V8	Audio Output	12L6GT	12L6GT	7B	
V9	Sync Amp.-Vert. Osc.	6SN7GTA	6SN7GTA	8BD	
	Vert. Output	12W8GT	12W8GT	4CG	
V10	Horiz. AFC-Horiz. Osc.	6SN7GTA	6SN7GTA	8BD	
V13	Horiz. Output	25CD6G	25CD6G	8BT	
V13	Damper	12AX4GT	12AX4GT	4CG	
V14	HV Rectifier	1X2B	1X2B	9Y	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: ARVIN PART No.	CBS-HYTRON PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No.	RETMA BASE TYPE	NOTES
V15	21YP4	21YP4 21YP4A ①	21YP4 21YP4A ①	21YP4 21YP4A ①	21YP4 21YP4A ①	12L 12L	① Aluminized.

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP	RATING: VOLT	REPLACEMENT DATA: ARVIN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	150	150	42722						TVA-3405	Blue
B	150	150								Red
C	150	150								Red
C2A	40	150	42723						TVA-4430	
B	10	150								Blue
C	10	150								Blue
D	200	25								Yellow
C3	20	25	42724	PR825/25		BR253		TC26	TVA-1206	
C4	1000		41325-102	BPD-001	DD-102	K069	501-001	DC-521	5SK-D1	
C5	1000		41358-102	BPD-001	DD-102	K069	501-001	DC-521	5SK-D1	
C6	15			SU15NP0	TC2-15	TZ1N	NP0K-150		5TCC-Q15	
C7	470			BPD-0006	DD-801	K067	501-0006	UC-538	5GA-T6	
C8	800			BPD-0006	DD-801	K067	501-0006	UC-538	5GA-T6	
C9	800			BPD-005	DD-502	K069	501-005	UC-538	5HK-D6	
C10	.27									
C11	.47									
C12	1.2									
C13	470			S1470	D6-471	TP46	GP1K-471	UC-5547	5GA-T47	
C14	62									
C15	.56									
C16	10									
C17	82			S1S2	D6-S30	TZ3S	GP1K-S30		5GA-Q82	
C18	1.5									
C19	15			S1S5NP0	TC2-15	TZ1N	NP0K-150		5TCC-Q15	
C20	800			BPD-0006	DD-801	K067	501-0006	UC-538	5GA-T6	
C21	800			BPD-0006	DD-801	K067	501-0006	UC-538	5GA-T6	
C22	5000			BPD-005	DD-502	K069	501-005	UC-538	5HK-D6	
C23	260									
C24	800			BPD-0006	DD-801	K067	501-0006	UC-538	5GA-T6	
C25	800			BPD-0006	DD-801	K067	501-0006	UC-538	5GA-T6	
C26	5.6		40355-37							
C27	1000		23078	BPD-001	DD-102	K069	501-001	DC-521	5HK-D1	
C28	470		41052-2	BPD-00047	DD-471	K060	501-00047	DC-5347	5GA-T47	
C29	1000		23078	BPD-001	DD-102	K069	501-001	DC-521	5HK-D1	
C30	1000		23078	BPD-001	DD-102	K069	501-001	DC-521	5HK-D1	
C31	1000		23078	BPD-001	DD-102	K069	501-001	DC-521	5HK-D1	
C32	.22	200		P288-22		PT2S3		PT4023	5TM-P23	
C33	470		41052-2	BPD-00047	DD-471	K060	501-00047	DC-5347	5GA-T47	
C34	1000		23078	BPD-001	DD-102	K069	501-001	DC-521	5HK-D1	
C35	19		20205-23							
C36	1000		23078	BPD-001	DD-102	K069	501-001	DC-521	5HK-D1	
C37	1000		23078	BPD-001	DD-102	K069	501-001	DC-521	5HK-D1	
C38	1000		23078	BPD-001	DD-102	K069	501-001	DC-521	5HK-D1	
C39	10		20205-30							
C40	.05	200		P286-05	DF-503	PT2S5		PT415	5TM-S5	
C41	1000		23078	BPD-001	DD-102	K069	501-001	DC-521	5HK-D1	
C42	1000		23078	BPD-001	DD-102	K069	501-001	DC-521	5HK-D1	
C43	47		40355-23							
C44	.05	200		P286-05	DF-503	PT2S5		PT415	5TM-S5	
C45	3.3		20205-28	S13.3NP0	TC2-3.3	TZ0K	NP0K-3R3	2T-5533	5TCCB-V33	
C46	33		40355-22							
C47	47		40355-23							
C48	6.2		40355-29							
C49	10000		40063-103	BPD-01	DD-103	K083	511-01	DC-511	5HK-E1	
C50	10000		40063-103	BPD-01	DD-103	K083	511-01	DC-511	5HK-E1	
C51	10000		40063-103	BPD-01	DD-103	K083	511-01	DC-511	5HK-E1	
C52	10		40355-10	S1D	D5-100	TP09	GP1K-100	UC-541	5GA-Q1	
C53	1000			BPD-001	DD-103	K069	501-001	DC-521	5HK-D1	
C54	.22	400		P488-22		CUB4P22		PT4022	47M-P22	
C55	10000		40053-103	BPD-01	DD-103	K083	511-01	DC-511	5HK-E1	
C56	10000		42227-2	BPD-01	DD-103	K083	511-01	DC-511	5HK-E1	
C57	470			BPD-00047	DD-471	K060	501-00047	UC-5347	5GA-T47	
C58	.01	600		P688-01	D6-103	CUB6S1	511-01	PT601	47M-S1	
C59	.05	200		P288-05	DF-503	PT2S5		PT415	5TM-S5	
C60	4700			BPD-0047	DD-472	K079	501-0047	DC-5247	5HK-D47	
C61	4700			BPD-0047	DD-472	K079	501-0047	DC-5247	5HK-D47	
C62	.01	600		P688-01	D6-103	CUB6S1	511-01	PT601	47M-S1	
C63	.047	600		P688-05	DF-503	CUB6S5		PT605	47M-S5	
C64	.1	600		P688-1	DF-104	CUB6P1		PT601	47M-P1	
C65	.22	400		P488-22		CUB4P22		PT4022	47M-P22	

CAPACITORS (cont)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ARVIN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C66	.047	600		P688-05	DF-503	CUB6S5		PT605	47M-S5	
C67	.0033	600		P688-0033	D6-332	CUB6D33	GP2-333-332	PT6233	47M-D33	
C68	.047	200		P288-05	DF-503	PJ3S5		PT415	5TM-S5	
C69	.1	200		P289-1	DF-104	PJ3P1		PT401	5TM-P1	
C70	22		40355-15							
C71	82			S1S2	D6-S30	TZ3S	GP1K-S30	UC-5482	5GA-Q82	
C72	33		40355-22	S133	D6-330	TP3T	GP1K-330	UC-5482	5GA-Q33	
C73	.047	200		P288-05	DF-503	PJ3S5		PT415	5TM-S5	
C74	.022	200		P288-022		PJ3S22		PT4123	5TM-S22	
C75	.47	200		P288-5		PJ3S5		PT4S5	5TM-P5	
C76	330	500				SW5T33				Note 1
C77	330	500				SW5T33				Note 1
C78	330	500				SW5T33				Note 1
C79	.01	600		P688-01	D6-103	CUB6S1	GP2-333-103	PT611	47M-S1	
C80	330	500				SW5T33				Note 2
C81	S20	500				SW5T22				Note 2
C82	4700			BPD-0047	DD-472	K079	501-0047	DC-5247	5HK-D47	
C83	.047	600		P688-05	DF-503	CUB6S5		PT605	47M-S5	
C84	22	3000	40539-5							Note 3
C85	S6									
C86	10000			BPD-01	DD-103	K083	501-01	DC-511	5HK-E1	
C87	.22	400		P488-22		CUB4P22		PT4022	47M-P22	Note 4
C88	.22	400		P488-22		CUB4P22		PT4022	47M-P22	Note 4

Note 1. Some versions may use a 270MMF in this application.
Note 2. Some versions may use a 1000MMF in this application.
Note 3. Not used in all versions.
Note 4. Some versions may use a .47MFD @400V in this application.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ARVIN PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	E22464-89	Q11-133	A47-500K-S	B-517-S	U-50	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	Not Req.	SWE-13	Not Req.	US-28	Attach to R1A
R2A	1500Ω	½	E23464-90	*QJ-805	RTV-498	F1-7	UF152R	Contrast-Panel
B	1000Ω	½				R2-31	UR15L	Brightness Rear
R3A	400KΩ	½	E23464-91	*QJ-806	RTV-494	F1-62	UF55L	Vert. Hold-Panel
B	100KΩ	½				R3-51	UR16L	Horiz. Hold-Rear
R4	1500Ω	1	43666		39-1500			Vert. Linearity Wire-wound
R5A	3Meg	½	D41840-4	Q11-140	A47-3Meg-S	BX-84	SU-59	Height
B	Shaft		Not Req.	Not Req.	FKP-1/4	Not Req.	Not Req.	Attach to R5A
R6	600Ω	1	A43238		39-600			Buzz Wire-wound

† Universal Replacement (Mallory Exact Duplicate Part No. UE-165)
Universal Replacement (Mallory Exact Duplicate Part No. UE-1390)
* CONCENTRIKIT EQUIVALENT: KIT K-3, BASE ELEMENTS & SHAFTS: B1Y-109 & P1-030 (PANEL)
BU-128 & R1-131L (REAR)
* CONCENTRIKIT EQUIVALENT: KIT K-3, BASE ELEMENTS & SHAFTS: BU-133 & P1-030 (PANEL)
BU-128 & R1-113 (REAR)

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: ARVIN PART No.	IRC PART No.	NOTES
R7	68KΩ	1		BTA-68K	
R8	68KΩ	1		BTA-68K	Note 6
R9	2200Ω	½		BTS-2200	Note 4
R10	15KΩ	½		BTS-15K	
R11	2200Ω	½		BTS-2200	
R12	470Ω	½		BTS-470	
R13	220KΩ	½		BTS-220K	
R14	6800Ω	½		BTS-6800	Note 1
R15	10KΩ	½		BTS-10K	
R16	15KΩ	½		BTS-15K	
R17	4700Ω	½		BTS-4700	
R18	470Ω	½		BTS-470	
R19	1000Ω	½		BTS-1000	
R20	2700Ω	½		BTS-2700	
R21	47Ω	½		BTS-47	
R22	470Ω	½		BTS-470	
R23	1000Ω	½		BTS-1000	
R24	47Ω	½		BTS-47	
R25	470Ω	½		BTS-470	
R26	180Ω	½		BTS-180	
R27	470Ω	½		BTS-470	
R28	10KΩ	½		BTS-10K	
R29	5600Ω	½		BTS-5600	
R30	1Meg	½		BTS-1Meg	
R31	1Meg	½		BTS-1Meg	
R32	1000Ω	½		BTS-1000	
R33	82Ω	½		BTS-82	
R34	2700Ω	½		BTS-2700	
R35	56KΩ	½		BTS-56K	
R36	4700Ω	½	41075-472	PW4-4700	
R37	100Ω	½		BTA-100Ω	
R38	120KΩ	½		BTS-120K	
R39	100KΩ	½		BTS-100K	
R40	10KΩ	½		BTS-10K	
R41	2200Ω	½		BTS-2200	
R42	8200Ω	½		BTS-8200	
R43	56KΩ	½		BTS-56K	
R44	4700Ω	½		BTS-4700	
R45	6800Ω	½		BTA-6800	
R46	68KΩ	½		BTS-68K	
R47	330KΩ	½		BTS-330K	
R48	47KΩ	½		BTS-47K	
R49	150Ω	½		BTS-150	
R50	470Ω	½		BTA-470	
R51	10KΩ	½		BTS-10K	
R52	150KΩ	½		BTS-150K	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: ARVIN PART No.	IRC PART No.	NOTES
R53	2.2Meg	½		BTS-2.2Meg	
R54	82KΩ	½		BTS-82K	Note 6
R55	18KΩ	½		BTA-18K	Note 4
R56	33KΩ	½		BTS-33K	
R57	22KΩ	½		BTS-22K	
R58	560Ω	½		BTS-560	
R59	1200Ω	½		BTS-1200	
R60	47KΩ	½		BTS-47K	
R61	10KΩ	½		BTS-10K	
R62	330KΩ	½		BTS-330K	
R63	1Meg	½		BTS-1Meg	
R64	2.2Meg	½		BTS-2.2Meg	
R65	220Ω	½		BTS-220	
R66	47Ω	½		BTS-47	
R67	220Ω	½		BTS-220	
R68	390KΩ	½		BTS-390K	
R69	330KΩ	½		BTS-330K	
R70	680Ω	½		BTS-680	
R71	680Ω	½		BTS-680	
R72	820KΩ 5%	½		BTS-820K 5%	Note 2
R73	150KΩ 5%	½		BTS-150K 5%	
R74	1.3Meg 5%	½		BTS-1.3Meg 5%	Note 3
R75	470KΩ 5%	½		BTS-470K 5%	Note 4
R76	3900Ω	½		BTS-3900	
R77	47KΩ	½		BTS-47K	
R78	82KΩ	½		BTS-82K	Note 6
R79	18KΩ	½		BTA-18K	Note 4
R80	150KΩ 5%	½		BTS-150K 5%	
R81	18KΩ	½		BTS-18K	
R82	68KΩ	½		BTA-68K	
R83	150KΩ	½		BTS-150K	
R84	47KΩ	½		BTA-47K	Note 5
R85	2200Ω	½		BTS-2200	Note 4
R86	47Ω	½		BTS-47	
R87	150KΩ	½		BTS-150K	
R88	470Ω	1		BTA-470	Note 7
R89	470Ω	1		BTA-470	Note 7
R90	1.8Ω	1	20206-18		
R91	10KΩ	½		BTS-10K	
R92	220KΩ	½		BTS-220K	
R93	*		42711		
R94	100Ω	4	41075-101	PW4-100	
R95	1Ω	1	41853		
R96	68KΩ	½		BTA-68K	

* Tube saver resistor 200Ω at room temperature, resistance drops to 40Ω as tubes heat up.
Note 1: Some versions may use a 47000 resistor in this application.
Note 2: Some versions may use a 1Meg resistor in this application.
Note 3: Some versions may use a 1. 8Meg resistor in this application.
Note 4: Not used in some versions.
Note 5: Some versions may use a 82KΩ resistor in this application.
Note 6: Some versions may use a 100KΩ resistor in this application.
Note 7: In some versions R88 is a 100Ω , 2 watt resistor and R89 is omitted.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: ARVIN PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Holldorson PART No.	Thordorson PART No.
T1	Vert. Osc. Trans.	42786-1	A-8125 ①	A-3003 ①	A-9TX ①	20VT1 ①	B8703 ①	24A87 ①
T2	Horiz. Output Trans.	42721	A-8233* ②		D-35 * ②	23ZT1 * ②	FB414* ②	FLY-8* ②
T3	Vert. Output Trans.	42756-1	A-8149 ① ③					26S71
T4A	Yoke - Horiz. (20MM)	43720 ④	DY-11A ④	MDF-73 ④	Y-33-1 ④	223DM ④	DF605 ④	Y-10 ④
B	Vert. (49MM)	43701 ④						

① Drill one new mounting hole.
② Drill new mounting holes.
③ Connect blue lead to plate (pin #3, V10); Connect red lead of trans. to green lead of yoke.
Remove yellow lead of yoke from ground and connect it and black lead of trans. to junction of R87 & C3A (pin #1, V10).
④ Includes capacitor C8S; resistors R70 and R71.
⑤ Yoke cover & positioning device.
⑥ Use original yoke cover and positioning device.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Stancor Replacement Connections	Merit Replacement Connections	Triad Replacement Connections	RCA Replacement Connections	Holldorson Replacement Connections	Thordorson Replacement Connections
	3	7		10	10	2	2
	2	6		9 & 7	9	4	4
	1	3		1	1	5	5
Special Notes →				7	7		

⑦ Jumper terms #2 & #3.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: ARVIN PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Holldorson PART No.	Thordorson PART No.	NOTES
T5	2.2KΩ	3.4Ω	42144-2	A-3332	A-3025	S-12X	Z1J01	26S58	

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: ARVIN PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3.4Ω	42749 ↓	ST-113 Mod. P4-X	4A07	↓ Used in Models 21-555, 21-557 ② Used in Model 21-554
	6"	PM	3.4Ω	42529 ②	ST-108 Mod. P6-X		

COILS (RF-IF)

ITEM No.	USE	DC RES.: PRI.	DC RES.: SEC.	REPLACEMENT DATA: ARVIN PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Trans.	00CT	00CT					
L2	Ant. Coils	0Ω						
L3	Ant. Coil	0Ω						Channel 13
L4	Fil. Choke	0Ω						
L5	RF Coil	0Ω						Channel 13
L6	RF Coils	0Ω						
L7	Mixer Coils	0Ω						
L8	Mixer Coil	0Ω						Channel 13
L9	Feedback Coil	1Ω						
L10	Osc. Coil	0Ω						Channel 13
L11	Osc. Coils	0Ω						
L12	Osc. Coil	0Ω						Channel 6
L13	Fil. Choke	0Ω						
L14	Conv. Plate	.4Ω						
L15	1st Video IF	0Ω		42753-1				
L16	41.35MC trap	0Ω		42757-1			6226	
L17	2nd Video IF	.6Ω	.6Ω	42754-1	19-4822		6216	
L18	Fil. Choke	0Ω		42781-1	19-1001		1804	1.3 Microhenries
L19	3rd Video IF	.4Ω	.4Ω	42751-2	19-4823		6218	
L20	4th Video IF	.3Ω	.4Ω	42753-1	19-4824		6216	
L21	Series Peaking Coil	4Ω		42762-2	19-3093▲	TV-181▲	6177▲	90 Microhenries, Wound on 1Meg resistor
L22	4.5MC trap	1.6Ω		42756-1	20-1004	TV-151	1469	
L23	Series Peaking coil	7.5Ω		42762-1	19-3250▼	TV-185▼	6181▼	250 Microhenries, Wound on 10KΩ resistor
L24	Shunt Peaking coil	11Ω		42762-3	19-3500▲	TV-189▲	6174▲	550 Microhenries, Wound on 22KΩ resistor
L25	1st Sound IF	1.5Ω		42754-1	20-1004	TV-151	1469	
L26	2nd Sound IF	3.8Ω*		43750-1				
L27	Quadrature Coil	6.8Ω		43756-1	20-1004	TV-151	1469	
L28	Horiz. Osc.	93Ω		42759-1	20-1402	TV-162	6183	Waveform winding = 52Ω

* Tapped at .4Ω and 1.4Ω
▲ Parallel with 1Meg resistor
▼ Parallel with 10KΩ resistor.
● Parallel with 22KΩ resistor.

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D. C. RESISTANCE	RATINGS: INDUCTANCE @ CURRENT 1000 ~	REPLACEMENT DATA: ARVIN PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Holldorson PART No.	Thordorson PART No.
L29	.210A	13.2Ω	8.7H	42760-1				C5041	26C43 ①

① Drill one new mounting hole.

PARTS LIST AND DESCRIPTIONS (Continued)

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	ARVIN PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	SELETRON PART No.	
M1	.210A	42763	1236A	RS300	6S300	300	6Q2	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		ARVIN PART No.	FEDERAL PART No.	SYLVANIA PART No.	
M2	1N64	23261	1N60 or 1N64A	1N60 or 1N132	Video Det.

MISCELLANEOUS

ITEM No.	PART NAME	ARVIN PART No.	NOTES
M3A	Tuner	42677	VHF Models only
B	Tuner	42892	VHF & VHF-UHF Models
M4	Tuner	42893	UHF Models
M5	Centering Device	42701	
M6	Ion Trap	42523-2	
	Knob	42671-1	VHF Fine tuning (Mahogany) - VHF Models
	Knob	42671-2	VHF Fine tuning (Taupe) - VHF Models
	Knob	42838-1	VHF Fine tuning (Mahogany) VHF-UHF Models.
	Knob	42838-2	VHF Fine tuning (Taupe) - VHF-UHF Models
	Knob	42392	UHF Fine tuning
	Knob	42670-1	Channel Selector (Mahogany) VHF Models
	Knob	42670-2	Channel Selector (Taupe) VHF Models
	Knob	42875-1	Channel Selector (Mahogany) VHF-UHF Models
	Knob	42875-2	Channel Selector (Taupe) VHF-UHF Models
	Knob	42669-1	Contrast & Vert. (Mahogany)
	Knob	42669-2	Contrast & Vert. (Taupe)
	Knob	42668-1	Brightness & Horiz. Hold (Mahogany)
	Knob	42668-2	Brightness & Horiz. Hold (Taupe)
	Knob	42667-1	On-off-volume (Mahogany)
	Knob	42667-2	On-off-volume (Taupe)
	Safety Glass	42616	
	Mask	42615-1	Green
	Mask	42615-2	Gold
	Cabinet Cover	42734-1	Rear (Model 21-555)
	Cabinet Cover	42734-2	Rear - Models 21-554 & 21-557
	Arvin Name Plate	42803-3	

PROPERTY OF
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DENVER, COLORADO

TROUBLE SHOOTING AIDS (cont)

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V11, V12, V13 and V14. Check waveform W12.

If Satisfactory	If Unsatisfactory
Check T2, T4A, C84, C83, R88 and other associated components.	Check L28, C78, C79, C82, R3B R81, R82 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V12 and V13. Check M1. Check R95, R93, R88, C82, C80, C81, T2, T4A and other associated components.

BLOOMING

Check by substitution V12, V13 and V14. Check M1. Check R95, R93, C82 and other associated components.

GENERAL

RASTER, SOUND, NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER, PICTURE, NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER, NO SOUND, NO PICTURE

Check by substitution V1, V2, V3, V4, V5 and V6. Check video IF components for failure or change of value.

NO RASTER, NO SOUND

Follow procedure outlined under "Dead Set".

KEYSTONE EFFECT

Check T4 and its associated components.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.

CHASSIS BOTTOM VIEW-TRANS., INDUCTOR & ALIGN. IDENTIFICATION

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs.

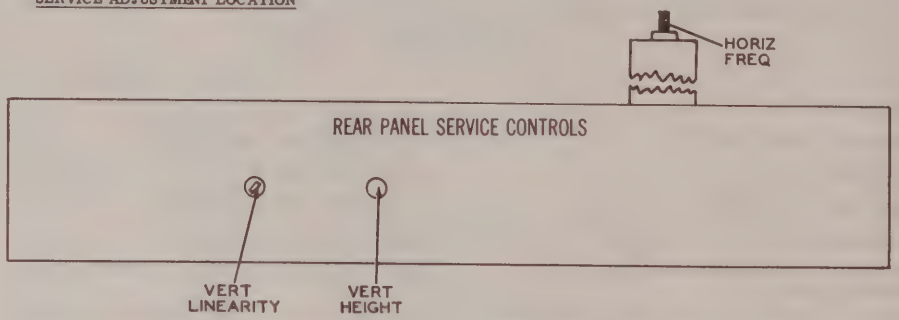
PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety glass cleaning, it is necessary to remove chassis. (See disassembly instructions).

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to set. Adjustment is located on top of chassis. Set the horizontal hold control at the center of its range and adjust the horizontal frequency slug (L28) until picture synchronizes horizontally. (For location see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

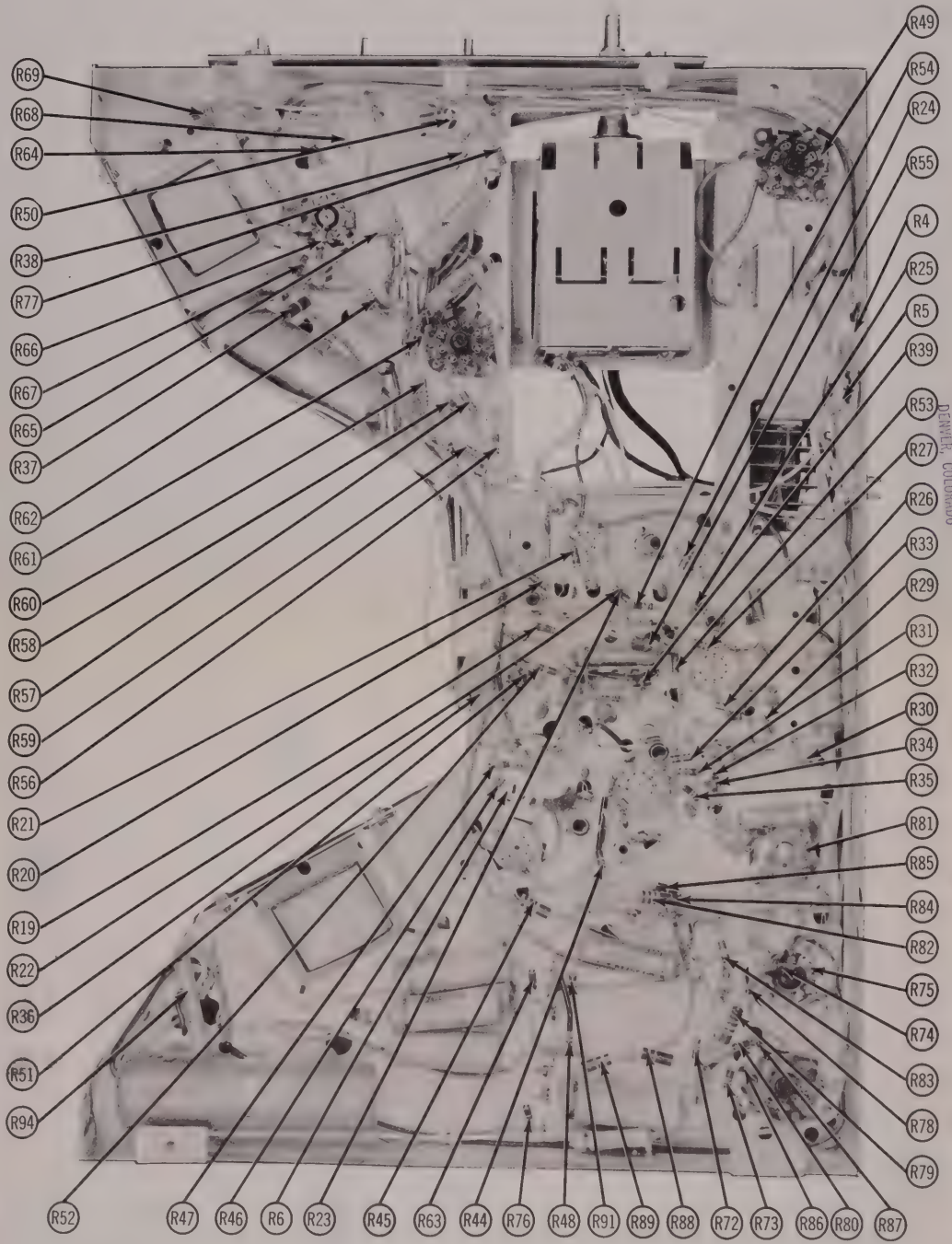
To eliminate sound IF detector buzz, it is necessary to remove rear cover and supply power to set. Adjustment is located on top of chassis. Adjust the buzz control for maximum volume and minimum buzz.

CENTERING

Centering is accomplished/mechanically by adjusting two magnetic rings around the neck of the tube until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

1. Remove 7 push-on type control knobs from side of cabinet.
2. Remove 13 metal screws from rear cover. Remove cover.
3. Disconnect red and red/white lead from terminal strip on HV cage.
4. Disconnect green and yellow lead from terminal strip on yoke assembly.
5. Disconnect speaker leads.
6. Loosen 3 tuner mounting screws. Slide tuner toward center of chassis.
7. Remove picture tube socket and HV lead.
8. Remove 4 chassis bolts. Remove chassis.
9. Remove 4 speaker nuts. Remove speaker.



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

ASTATIC
UHF (UHF Conv.)

TRADE NAME	Astatic Model UHF	
MANUFACTURER	The Astatic Corp., Conneaut, Ohio	
TYPE SET	AC Operated All Channel UHF Converter	
TUBES (One)	Types 6T4 Oscillator	
POWER SUPPLY	105-125 Volts AC-60 Cycles	RATING .1 Amp. @ 117 Volts AC
TUNING RANGE	Channels 14 thru 83	

The UHF converter unit has been properly aligned at the factory and is very stable. Alignment of this unit should not be required in the field.
If replacement of the 6T4 becomes necessary, several tubes of the same type may have to be tried before a suitable replacement is found which will allow the converter to operated properly without realignment.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

ASTATIC MODEL UHF

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: ASTATIC PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	UHF Oscillator	6T4	6T4	7DK	6AF4 used in some sets

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ASTATIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	40	150		PRS150/40-40		BBRD4415		TCD-48	TVA-2445	
B	40	150								
C2	1.2									
C3	1.2									
C4	1.2									
C5	2.2			SI2.2NP0	TCZ-2.2	TZ05	NP0K-2R2		5TCCB-V22	
C6	4.7			SI4.7NP0	TCZ-4.7	TZ07	NP0K-4R7	ZT-5547	5TCCB-V47	
C7	10			SI10NP0	TCZ-10	TZ09	NP0K-100	ZT-541	5TCU-Q1	
C8	.82									

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: ASTATIC PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R1	1200Ω	2		BTB-1200	Note 1
R2	1200Ω	2		BTB-1200	

Note 1. Not used in some versions.

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: ASTATIC PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R3	27Ω	½		BTS-27	
R4	27Ω	½		BTS-27	

TRANSFORMER (POWER)

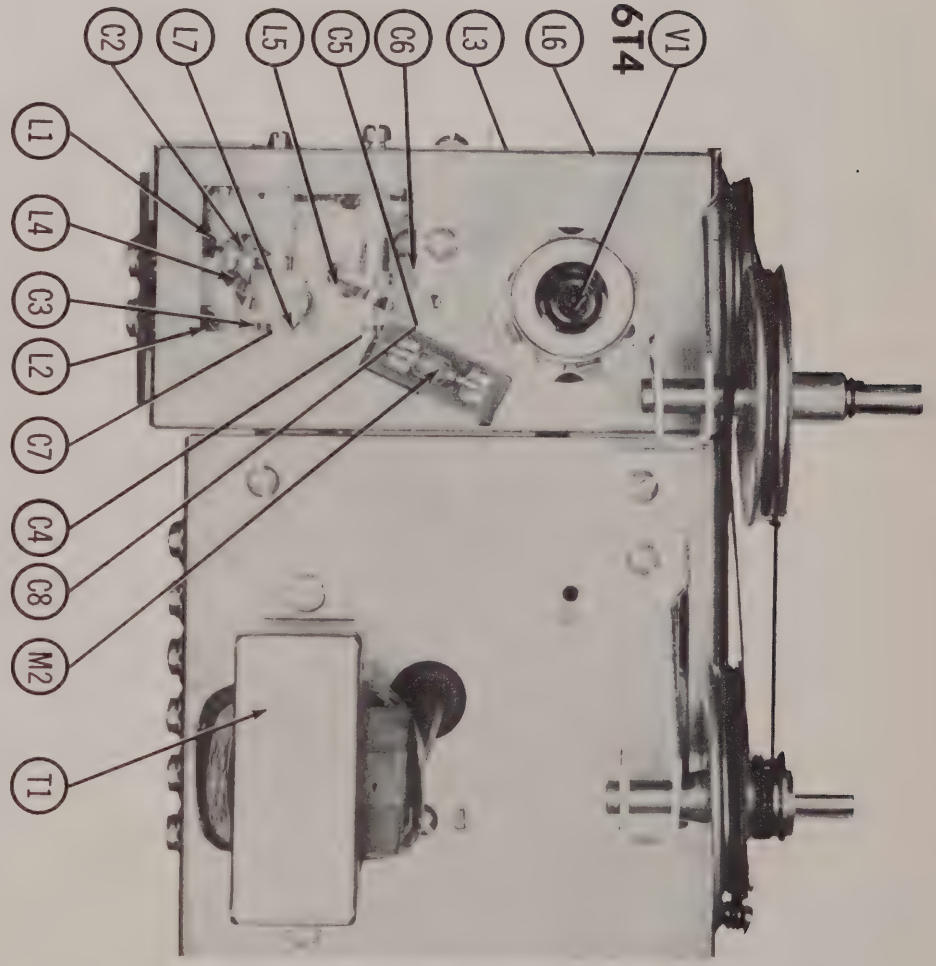
ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: ASTATIC PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC @ .1A	125V .015ADC	6.3VAC @ .25A			PS-8415①	P-3045 ①	R-30X ①	P9100 ①	26R32 ①

① Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: ASTATIC PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	UHF Ant. Coil	0Ω						
L2	UHF Ant. Coil	0Ω						
L3	UHF Ant. Mixer, Osc. Coils	0Ω						
L4	UHF Ant. Coil End Inductor	0Ω						
L5	UHF Mixer Coil End Inductor	0Ω						
L6	UHF Osc. Coil End Inductor	0Ω						
L7	UHF IF Coupling	0Ω						
L8	UHF Output Transformer	0Ω	0Ω					
L9	UHF IF Coupling Coil	0Ω						
L10	UHF IF Coupling Coil	0Ω						

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SELENIUM RECTIFIER

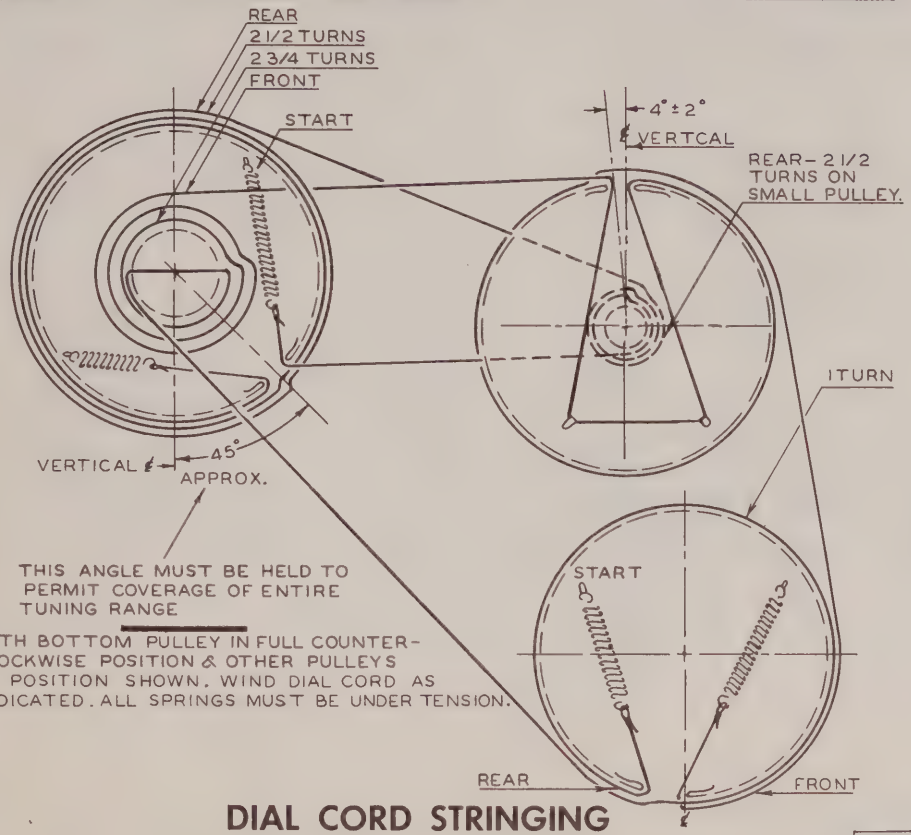
ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	ASTATIC PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	SELETRON PART No.	
M1	.015A		1263A	RS050	6S65	65	8J1	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		ASTATIC PART No.	SYLVANIA PART No.	FEDERAL PART No.	
M2	1N82		1N82 or 1N82A	1N82	UHF Mixer

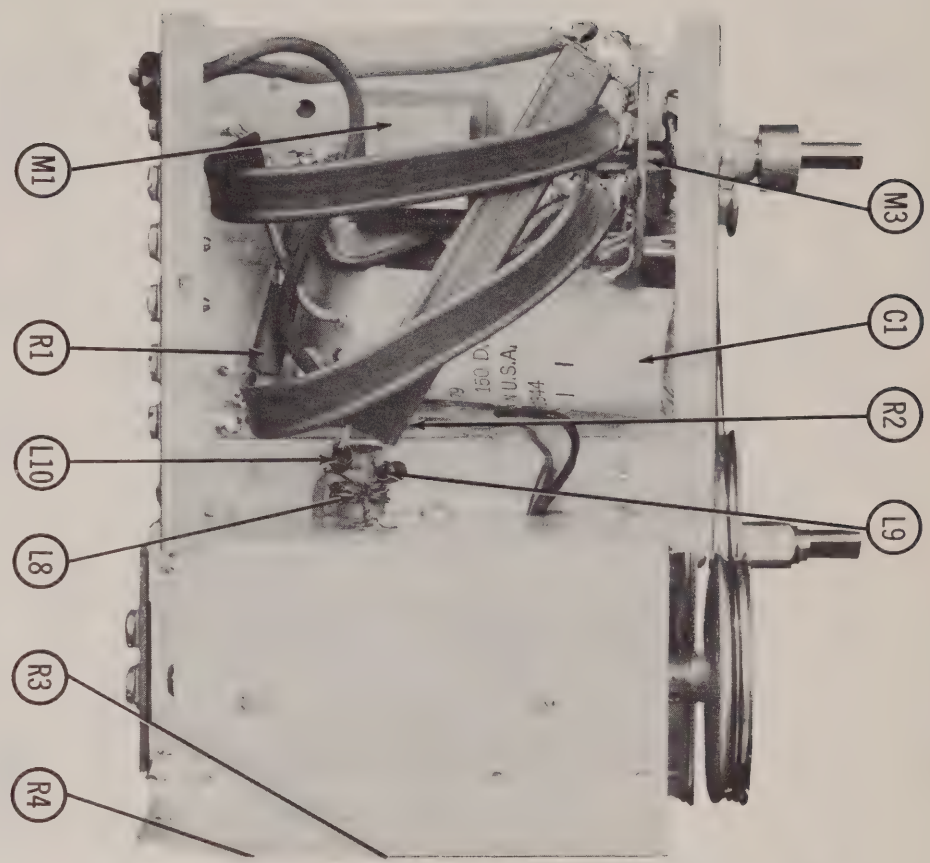
MISCELLANEOUS

ITEM No.	PART NAME	ASTATIC PART No.	NOTES
M3	Switch		On-off (VHF-UHF)



DIAL CORD STRINGING

CHASSIS—BOTTOM VIEW



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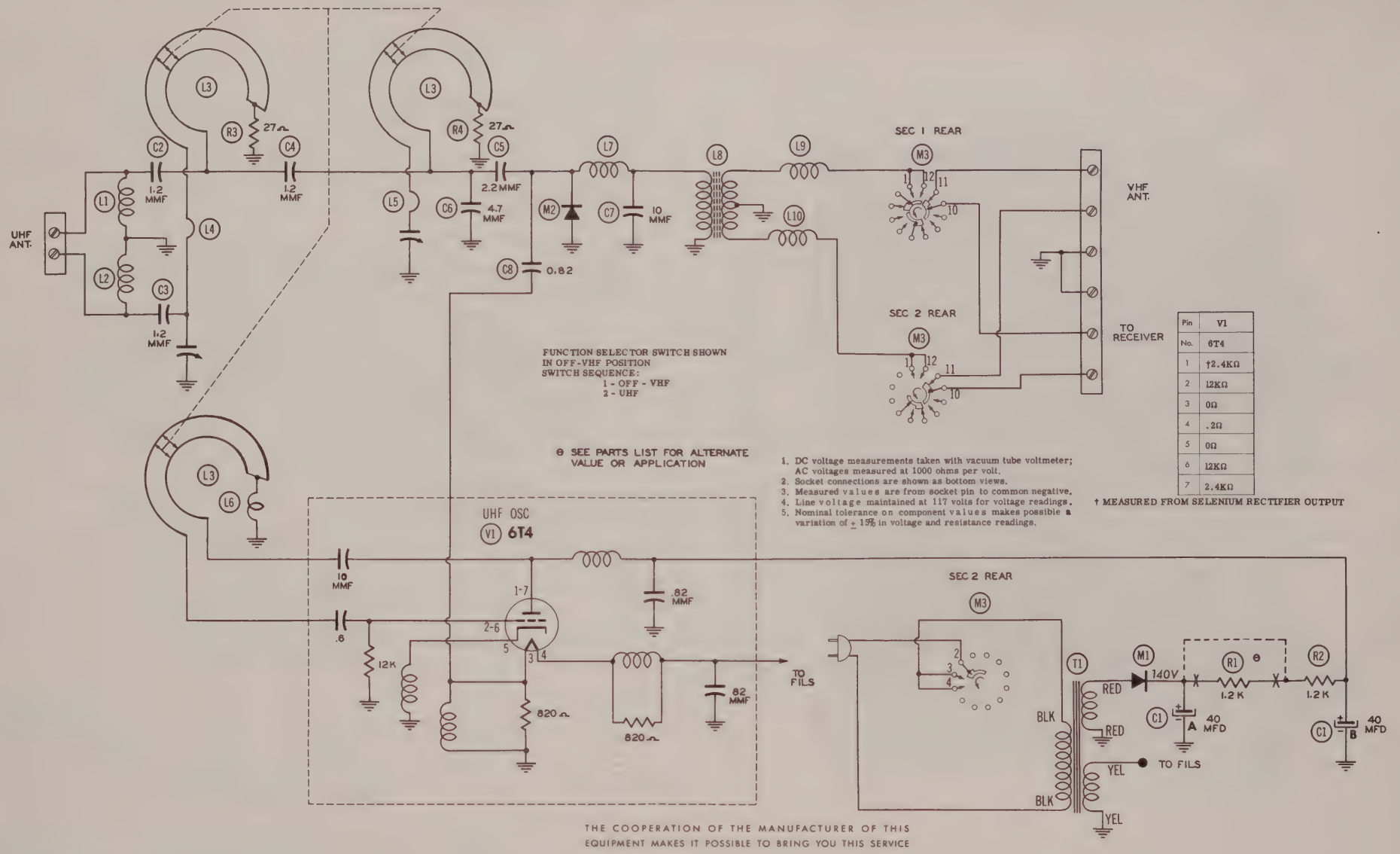

Pin No.	V1 6T4
1	†2.4KΩ
2	12KΩ
3	0Ω
4	.2Ω
5	0Ω
6	12KΩ
7	2.4KΩ

† MEASURED FROM SELENIUM RECTIFIER OUTPUT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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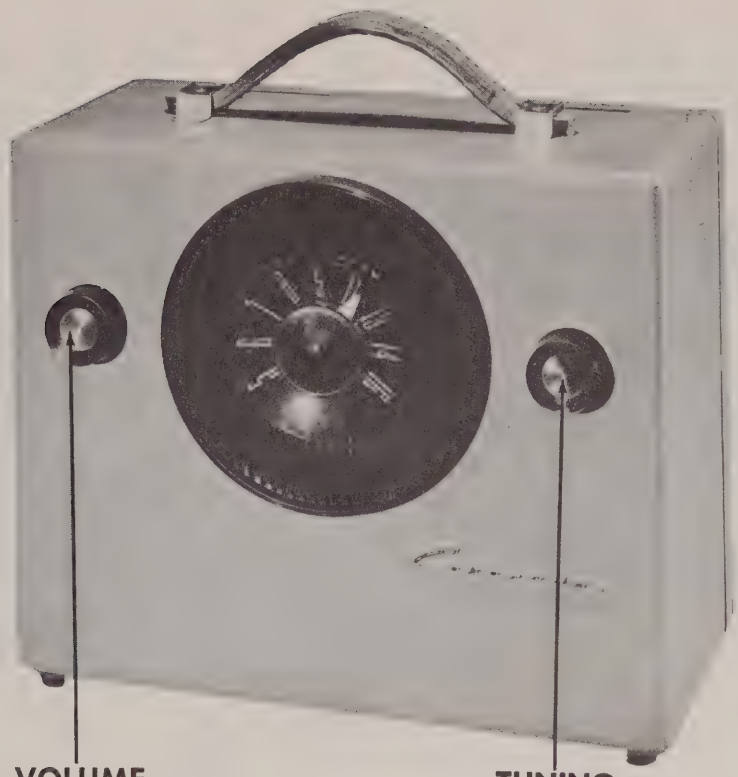
DENVER, COLORADO

CORONADO
MODEL RA33-9856D



CORONADO
MODEL RA33-9856D

TRADE NAME	Coronado Model RA33-9856D
SUPPLIER	Gamble-Skogmo Inc., 15 N. Eighth St., Minneapolis, Minn.
TYPE SET	Three Power Portable AM Superheterodyne Receiver
TUBES (Five)	Types 1U4 RF Amp., 1R5 Conv., 1U4 IF Amp., 1U5 Det-AVC-AF Amp., 3V4 Output
POWER SUPPLY	110-120 Volts AC-DC, (or) 9 Volts "A" Supply & 90 Volts "B" Supply In Pack Form
RATING	.12 Amp. @ 117 Volts AC (or) 70MA @ 9 Volts DC & 14.5MA @ 90 Volts DC
TUNING RANGE—BROADCAST	540KC - 1610KC

ALIGNMENT INSTRUCTIONS

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1MF	High side to grid (pin 6) of IF Amp. (V3). Low side to B-.	455KC (400~ 30% Mod.)	Tuning gang fully open..	Across voice coil.	A1, A2	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2	"	High side to grid (pin 6) of Converter (V2).	"	"	"	A3, A4	"
3	"	Loop	1610KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4		"	1400KC	1400KC	"	A6, A7	"

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PARTS LIST AND DESCRIPTIONS

CORONADO
MODEL RA33-9856D

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		CORONADO PART No.	STANDARD REPLACEMENT		
V1	RF Amp.	1U4	1U4	6AR	
V2	Conv.	1R5	1R5	7AT	
V3	IF Amp.	1U4	1U4	6AR	
V4	Det-AVC-AF Amp.	1U5	1U5	6BW	
V5	Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	CORONADO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▲50	200	C50-102					FP426.9		
B	■30	200								Note 1
C	▲150	25								
D	150	25								
C2	.05	400	C054	P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C3	.05	400	C054	P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C4	10	500								
C5	.05	400	C054	P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C6	10000		C105D	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C7	5000		C0055D	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C8A	200				D6-201	TP38	GP2K-201	UC-532		
B	2000				DD-202	K072	801-002	DC-522		
C	100		♦C34C4	♦PA-283	D6-101	TP34	GP1K-101	UC-531	♦34C4	
D	5000				DD-502	K080	801-005	DC-525		
E	5000				DD-502	K080	801-005	DC-525		
C9	2000		C0025D	BPD-002	DD-202	K072	801-002	DC-522		
C10	.05	400	C054	489ZX-05	DF-503	PJ4S5		PT415	4TM-S5	
C11	.05	400	C054	489ZX-05	DF-503	PJ4S5		PT415	4TM-S5	

♦ Items C8A, C8B, C8C, C8D and C8E are combined in one unit.
Note 1: C3C and C3D in parallel to give a 300MFD at 25V.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	CORONADO PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1Meg	½	VRP-102	Q13-137	A47-1Meg-Z	BSK-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-2	SWE-20	Not Req.	US-27	Attach to R1A

RESISTORS

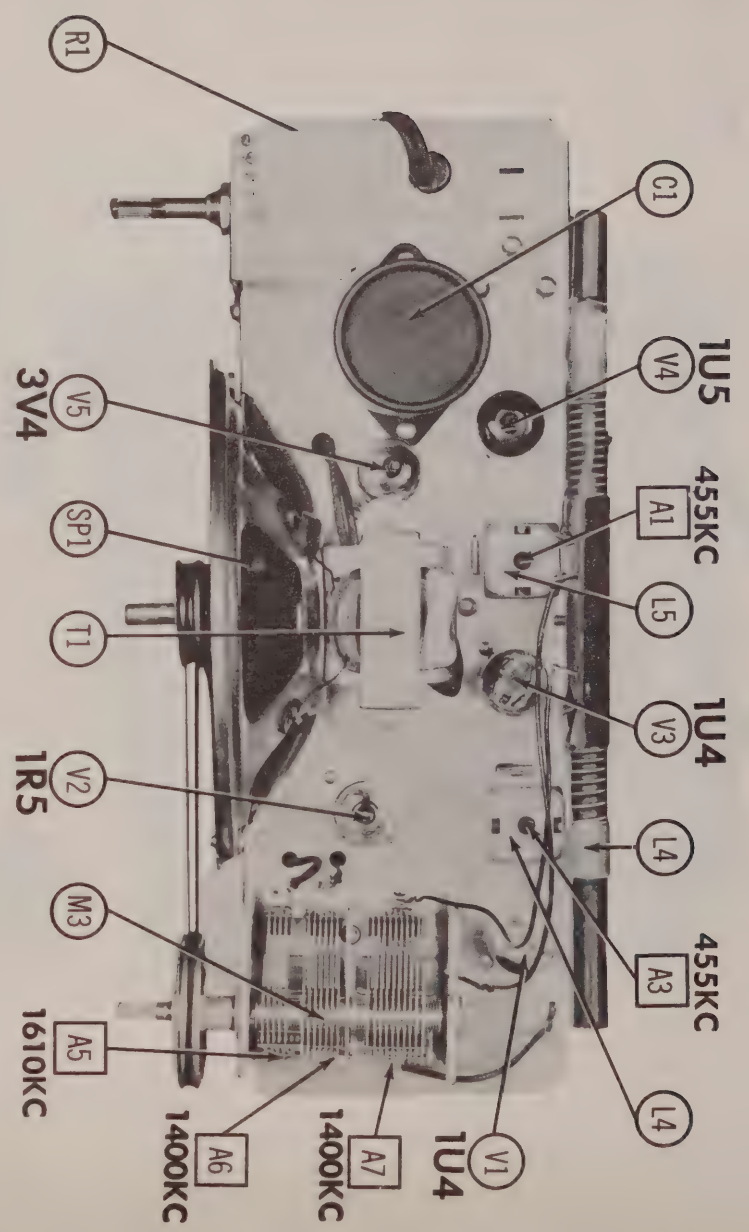
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	CORONADO PART No.	IRC PART No.	
R2	4.7Meg	½	R475.5	BTS-4.7Meg	
R3	22KΩ	½	R223.5	BTS-22K	
R4	100KΩ	½	R104.5	BTS-100K	
R5	27KΩ	½	R273.5	BTS-27K	
R6	10Meg	½	R106.5	BTS-10Meg	
R7	2.2Meg	½	R225.5	BTS-2.2Meg	
R8	47KΩ	½	R473.5	BTS-47K	
R9	10Meg	½	R106.5	BTS-10Meg	
R10	4.7Meg	½	R475.5	BTS-4.7Meg	
R11	1Meg	½		BTS-1Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	CORONADO PART No.	IRC PART No.	
R12	820KΩ	½	R824.5	BTS-820K	
R13	560Ω	½	R561.5	BTS-560	
R14	1500Ω	½	R152.5	BTS-1500	
R15	330Ω	½	R331.5	BTS-330	
R16	680Ω	½	R681.5	BTS-680	
R17	1500Ω	½	R152.5	BTS-1500	
R18	22000Ω 5%	7	R222.7		
R19	100Ω	2	R122		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	CORONADO PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	9.7KΩ	3.5Ω	Part of speaker	A-3879	A-2932	S-11X	Z1117	24S52	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	CORONADO PART No.	JENSEN PART No.	QUAM PART No.	
SP1	5"	PM	3.5Ω	SPK-102	ST-105 Mod. P5-X	5A1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	CORONADO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.6Ω		LT102				
L2	RF Coil	11Ω	11.5Ω*	LRT102				*Secondary Tapped at 4Ω
L3	Osc. Coil	6Ω	11Ω	LOT102				
L4	Input IF	19Ω	19Ω	LIFT102	16-6758	BC-352	12-C1	
L5	Output IF	19Ω	19Ω	LIFT102	16-6758	BC-353	12-C2	

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	CORONADO PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	SELETRON PART No.	
M1	.063	SR-65	1263A	RS65T	6S65	65	5M4	

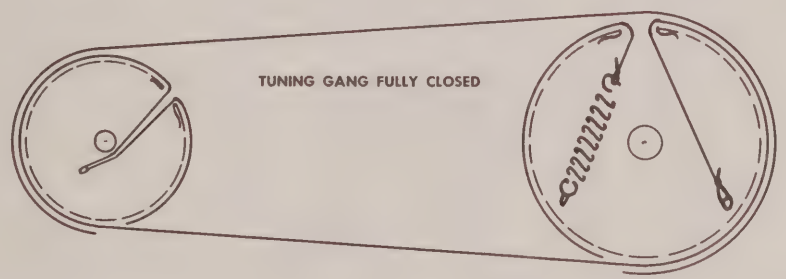
BATTERIES

ITEM No.	VOLTAGE	CORONADO PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	9V "A" 90V "B"	43-323			753*			F6A60 †	

* Requires adaptor socket; Cinch Mfg. Co. Socket No. 2901
† Use #3139 plug.

MISCELLANEOUS

ITEM No.	PART NAME	CORONADO PART No.	NOTES
M3	Tuning Cap.	VCP102	23-317MMF; 14-217MMF; 8-80MMF.
M4	Switch	S7642	Change-over
	Cabinet	P2501	Wood
	Knob	P2403	2 used
	Pointer	P2503	

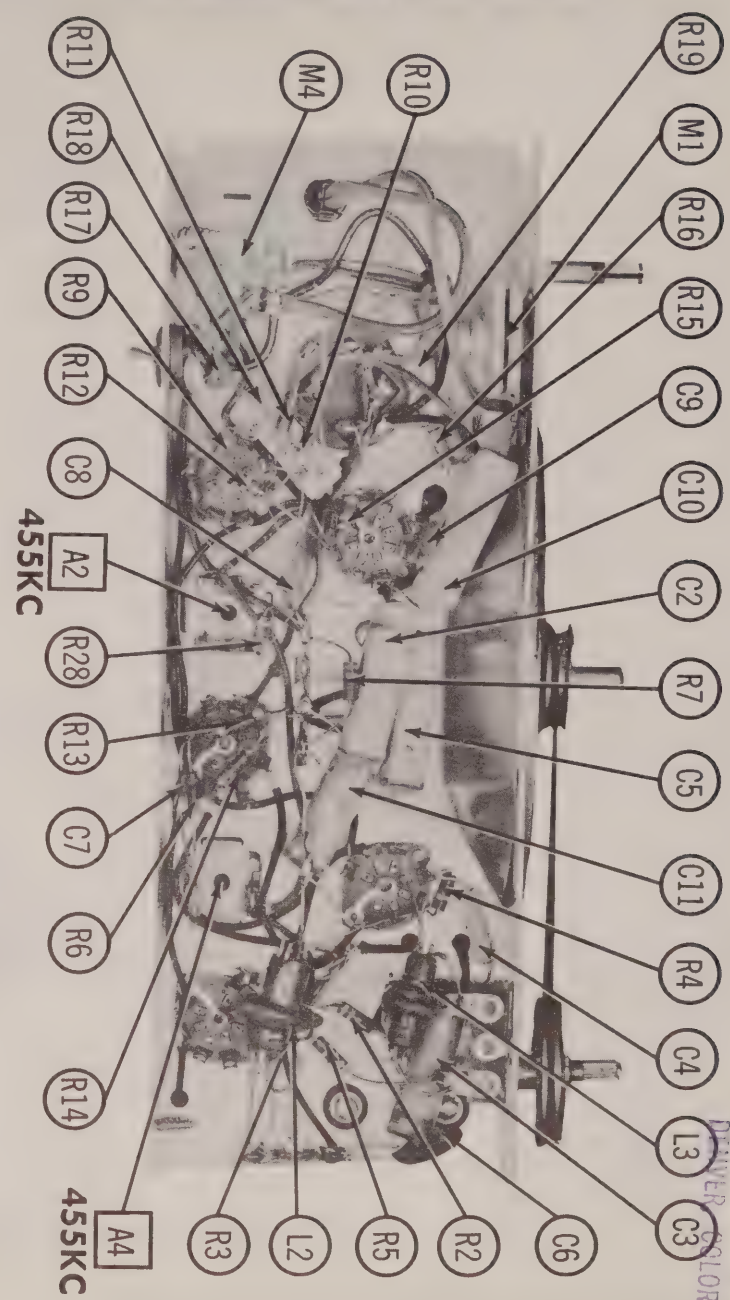


DIAL CORD STRINGING

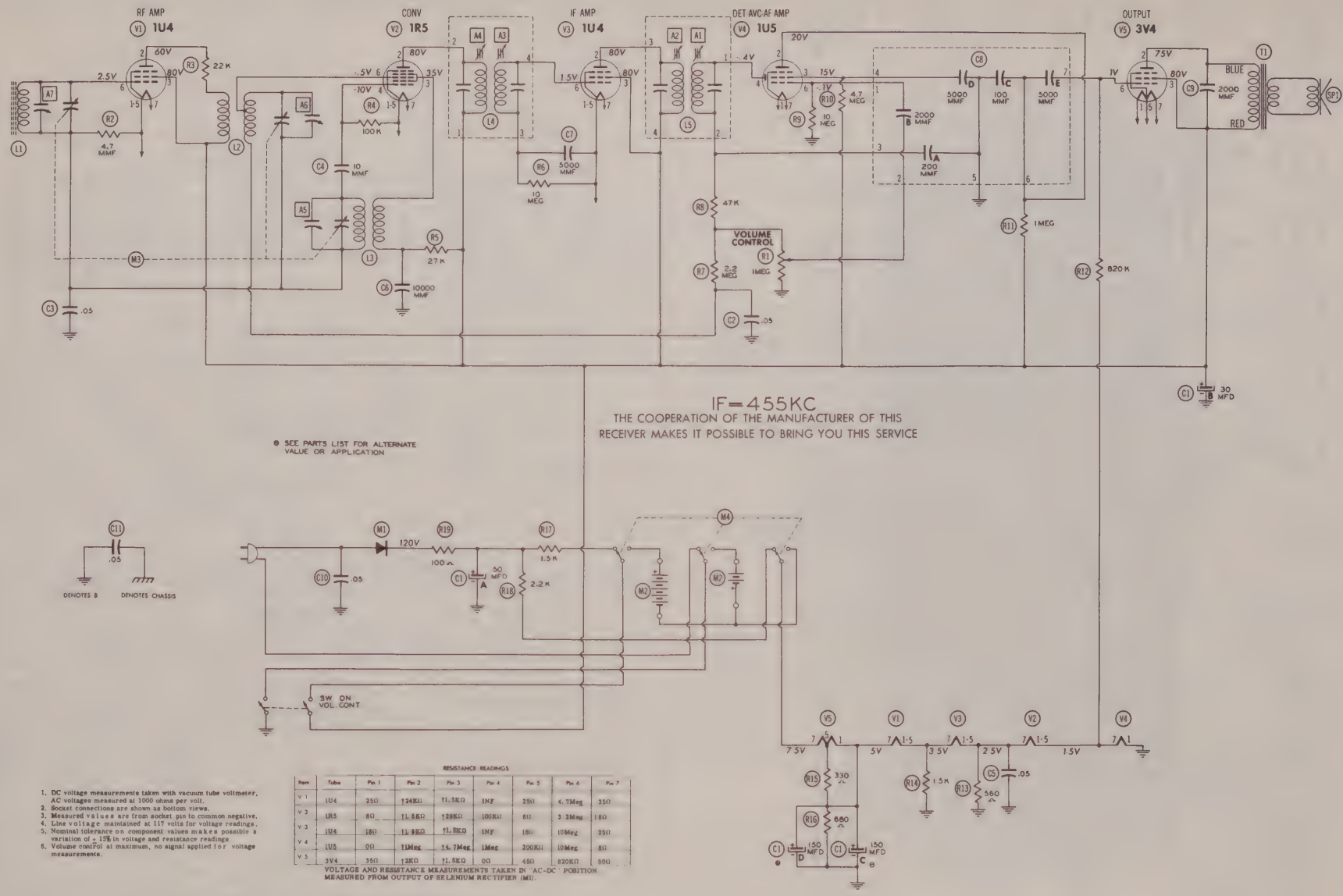
CORONADO
MODEL RA33-9856D

SET 264 FOLDER 5

CHASSIS—BOTTOM VIEW



CORONADO
MODEL RA33-9856D
DENVER COLORADO



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1U4	25Ω	↑24KΩ	↑1.5KΩ	INF	25Ω	4.7Meg	25Ω
V 2	1R5	6Ω	↑1.5KΩ	↑29KΩ	100KΩ	8Ω	3.2Meg	18Ω
V 3	1U4	18Ω	↑1.5KΩ	↑1.5KΩ	INF	18Ω	10Meg	25Ω
V 4	1U5	0Ω	↑1Meg	↑4.7Meg	1Meg	200KΩ	10Meg	8Ω
V 5	3V4	35Ω	↑2KΩ	↑1.5KΩ	0Ω	45Ω	820KΩ	50Ω

VOLTAGE AND RESISTANCE MEASUREMENTS TAKEN IN "AC-DC" POSITION MEASURED FROM OUTPUT OF SELENIUM RECTIFIER (M1).

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements.

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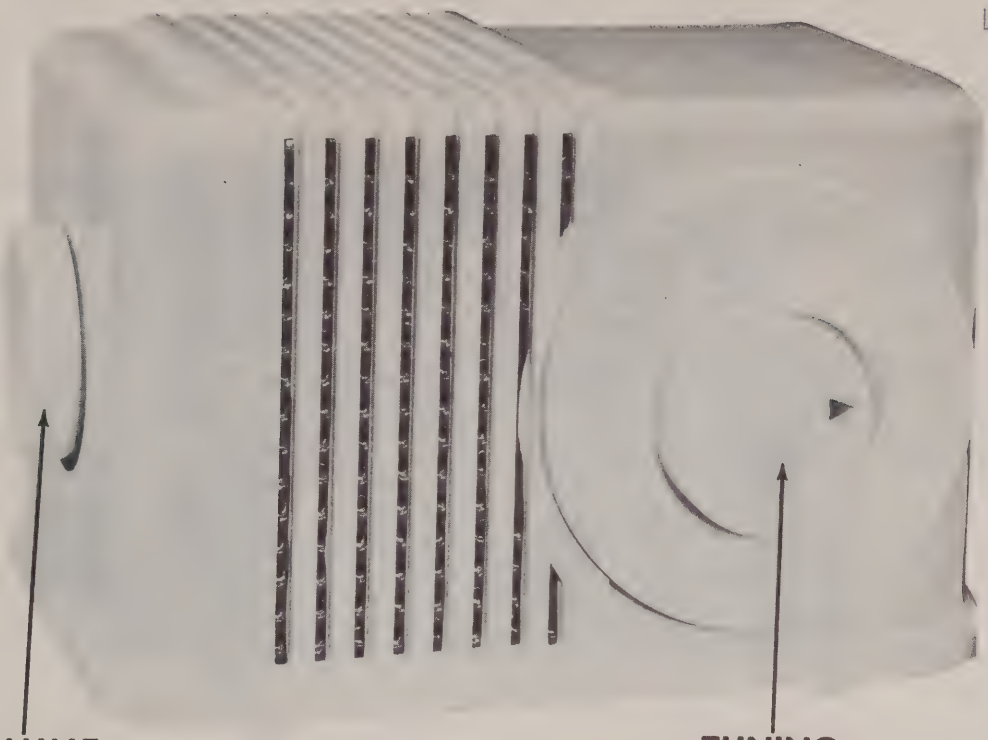

DEWALD
MODEL H-410

TRADE NAME	DeWald Model H-410
MANUFACTURER	DeWald Radio Mfg. Co., 35-15 37th Ave., Long Island City, N. Y.
TYPE SET	AC-DC Operated AM Superheterodyne Receiver
TUBES (Four)	Types 12AU6 Conv., 12AV6 Det-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC — RATING .24 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

With tuning gang fully closed set the right edge of "55" on the dial opposite the index mark on the cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.01MFD	High side to antenna stator lug on tuning gang. Low side to B-.	455KC (400~ Mod)	Tuning gang fully open.	Across voice coil.	A1, A2	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2		Loop	1620KC	"	"	A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3		"	1400KC	Tune to 1400KC signal.	"	A4	"
4		"	600KC	Tune to 600KC signal.	"		Bend slotted antenna rotor plates for maximum output. Repeat step 3.

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PARTS LIST AND DESCRIPTIONS

DEWALD MODEL H-410

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		DEWALD PART No.	STANDARD REPLACEMENT		
V1	Conv.	12AU6	12AU6	7BK	
V2	Det-AVC-AF Amp.	12AV6	12AV6	7BT	
V3	Output	50C5	50C5	7CV	
V4	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	DEWALD PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	30	150		PR8150/30-20-10		BBRD3315		3N533	TVA-2434	Yellow
B	30	150				BR102			TVA-1204	Blue
C	10	15								Green
C2	15									
C3A	220									
B	2000									
C	5000			*PA-113-1	*PC-150	*116TM1	*1408-01		*DT-1	
D	250									
E										
C4	.022	400		P488-022		CUB4S22		PT4122	4TM-S22	
C5	10000			BPD-01	DD-103	K082	801-01	DC-511	5HK-S1	
C6	.047	400		P488-047	DF-503	CUB4S47		PT4147	4TM-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	DEWALD PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	2Meg	½	3046-2	Q13-139	A47-2Meg-Z	AB-76	U-55	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-12	KB-1	US-26	Attach to R1A

Items C3A, C3B, C3C, C3D, C3E, R3A, R3B and R3C are combined in one unit.
When replacing items individually, items C3D and C3E should total 250MMF.

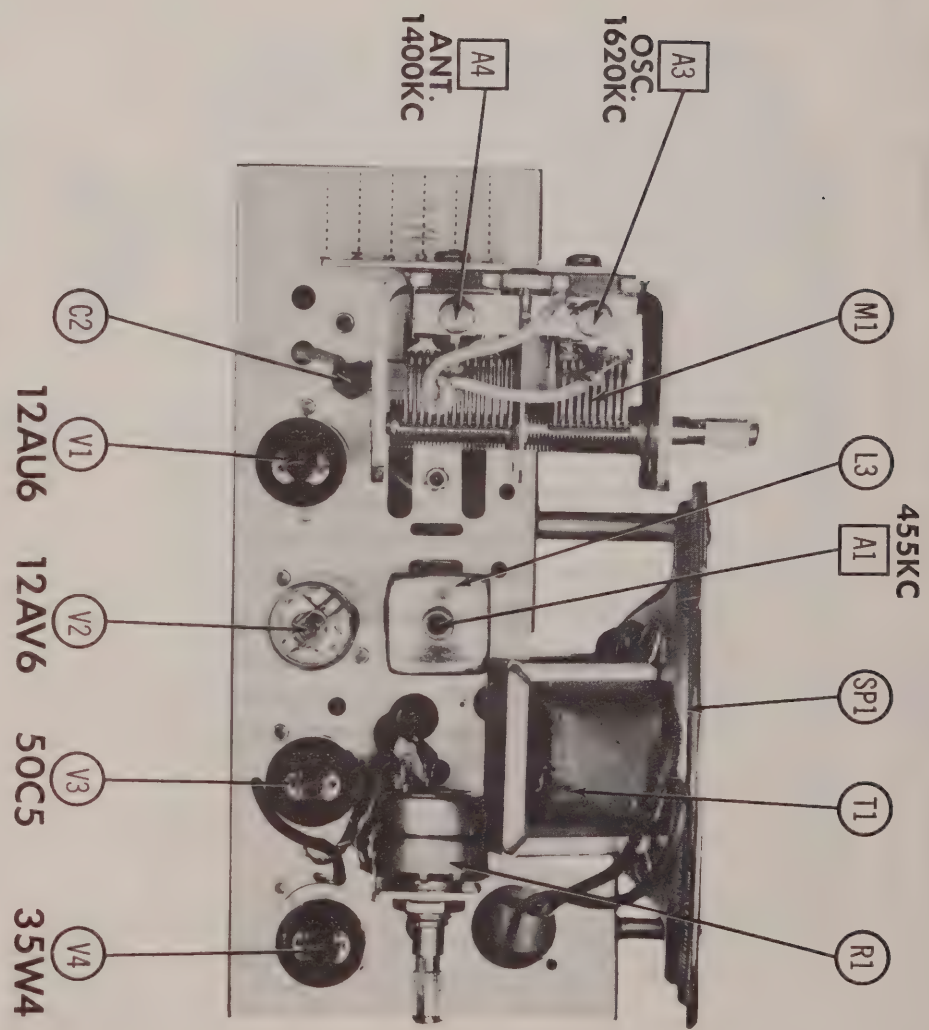
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	DEWALD PART No.	IRC PART No.	
R2	1.5Meg	½		BTS-1.5Meg	
R3A	6.8Meg	½		BTS-6.8Meg	
B	470KΩ	½	♦	BTS-470K	
C	470KΩ	½		BTS-470K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	DEWALD PART No.	IRC PART No.	
R4	180Ω	½		BTS-180	
R5	1000Ω	1		BTA-1000	
R6	15Ω	½		BTS-15	
R7	7Ω	2			

♦ Items R3A, R3B, R3C, C3A, C3B, C3C, C3D and C3E are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	DEWALD PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	2.3KΩ	3.4Ω	Part of speaker	A-3332	A-3025		Z1101	S-12X	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	DEWALD PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.4Ω	7003C-5	ST-113 Mod. P4-X	4A07	

COILS (RF-IF)

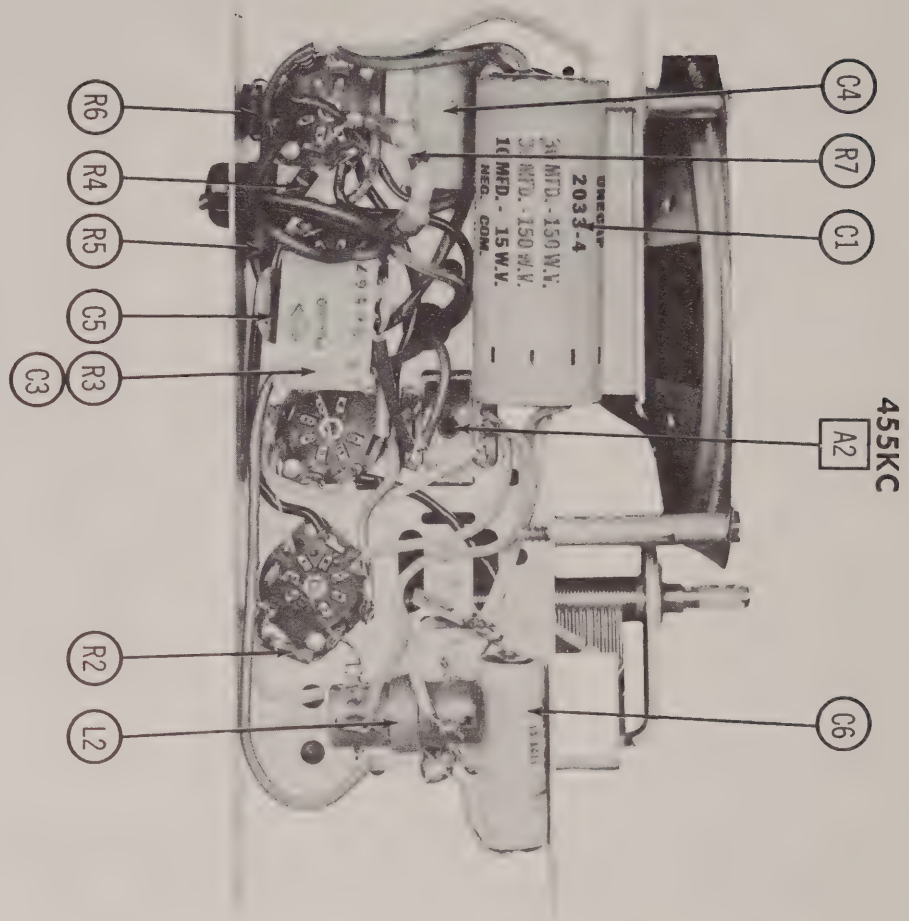
ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	DEWALD PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.7Ω						Includes Cabinet back Pickup winding = 1.8Ω
L2	Osc. Coil	1Ω	6.5Ω					
L3	IF Coil	28Ω *	28Ω	1091C-9				

* Tapped at 1.1Ω.

MISCELLANEOUS

ITEM No.	PART NAME	DEWALD PART No.	NOTES
M1	Tuning Cap	2072-1	35-485MMF., 19-180MMF

CHASSIS—BOTTOM VIEW



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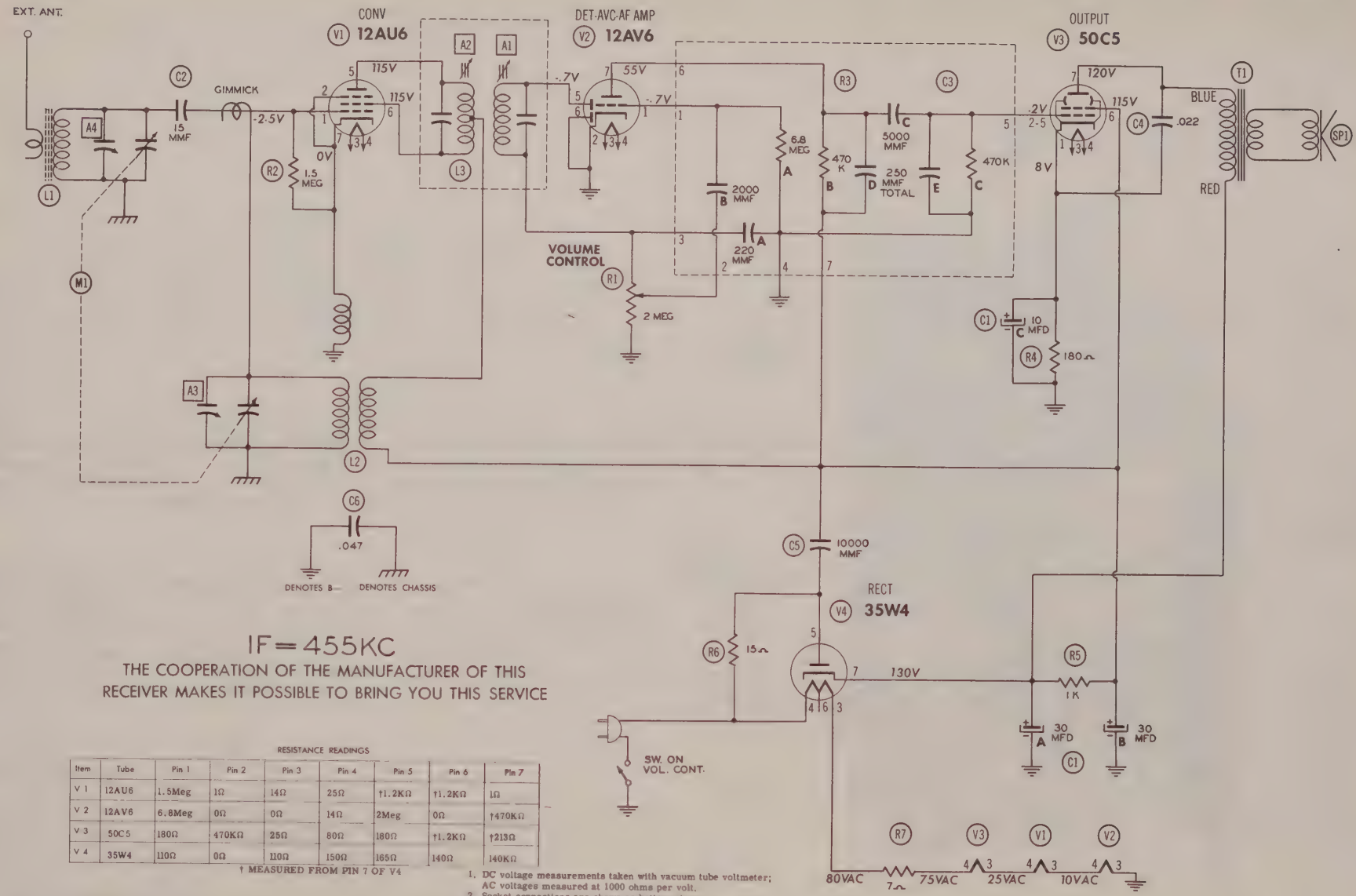

IF = 455KC

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RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12AU6	1.5Meg	1Ω	14Ω	25Ω	†1.2KΩ	†1.2KΩ	1Ω
V 2	12AV6	6.8Meg	0Ω	0Ω	14Ω	2Meg	0Ω	†470KΩ
V 3	50C5	180Ω	470KΩ	25Ω	80Ω	180Ω	†1.2KΩ	†213Ω
V 4	35W4	110Ω	0Ω	110Ω	150Ω	165Ω	140Ω	140KΩ

† MEASURED FROM PIN 7 OF V4

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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PHOTOFACT* Folder

GENERAL ELECTRIC MODELS 21C240, 21C241, 21T26, 21T27

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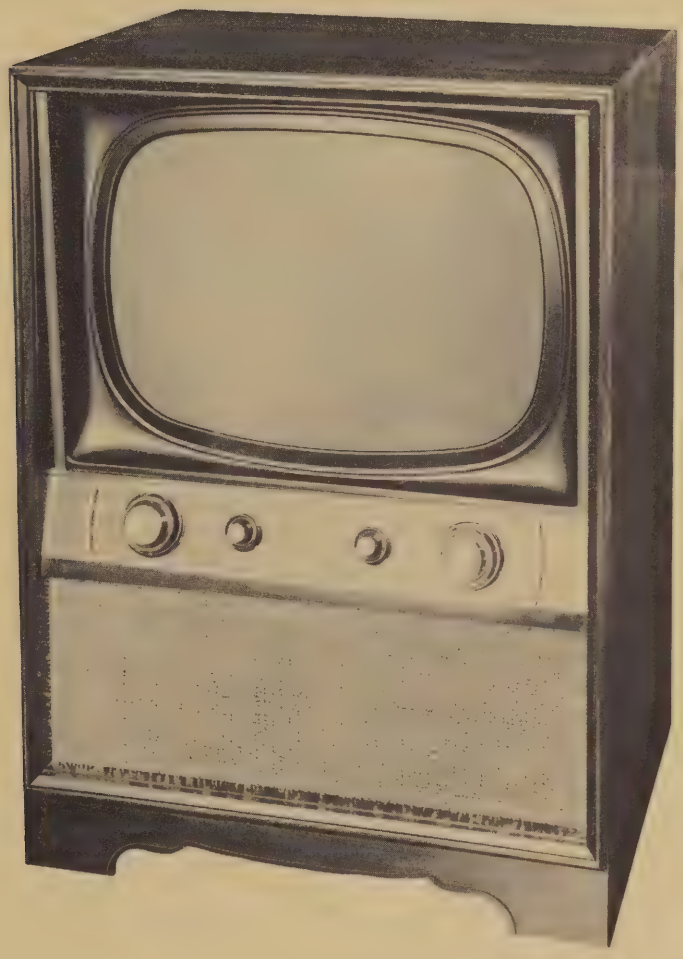

MODEL 21C240

GENERAL ELECTRIC MODELS
21C240, 21C241, 21T26, 21T27

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DATE 1–55 SET 264 FOLDER 7

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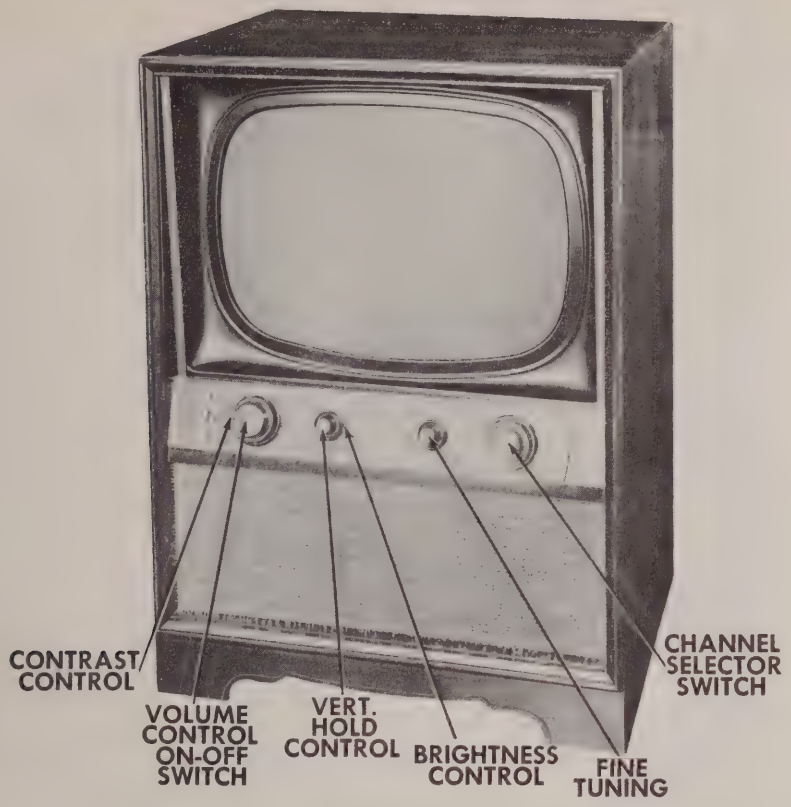

GENERAL ELECTRIC MODEL 21C240

TRADE NAME	General Electric Models 21C240, UHF, 21C241, UHF, 21C242, UHF, 21C243, UHF, 21C244, UHF, 21C245, UHF, 21T26, UHF, 21T27, UHF
MANUFACTURER	General Electric Co., Electronics Dept., Electronics Park, Syracuse, N. Y.
TYPE SET	Television Receiver
TUBES	Twenty
POWER SUPPLY	110-120 Volts AC - 60 Cycle RATING 2.03 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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GENERAL ELECTRIC MODELS
21C240, 21C241, 21T26, 21T27

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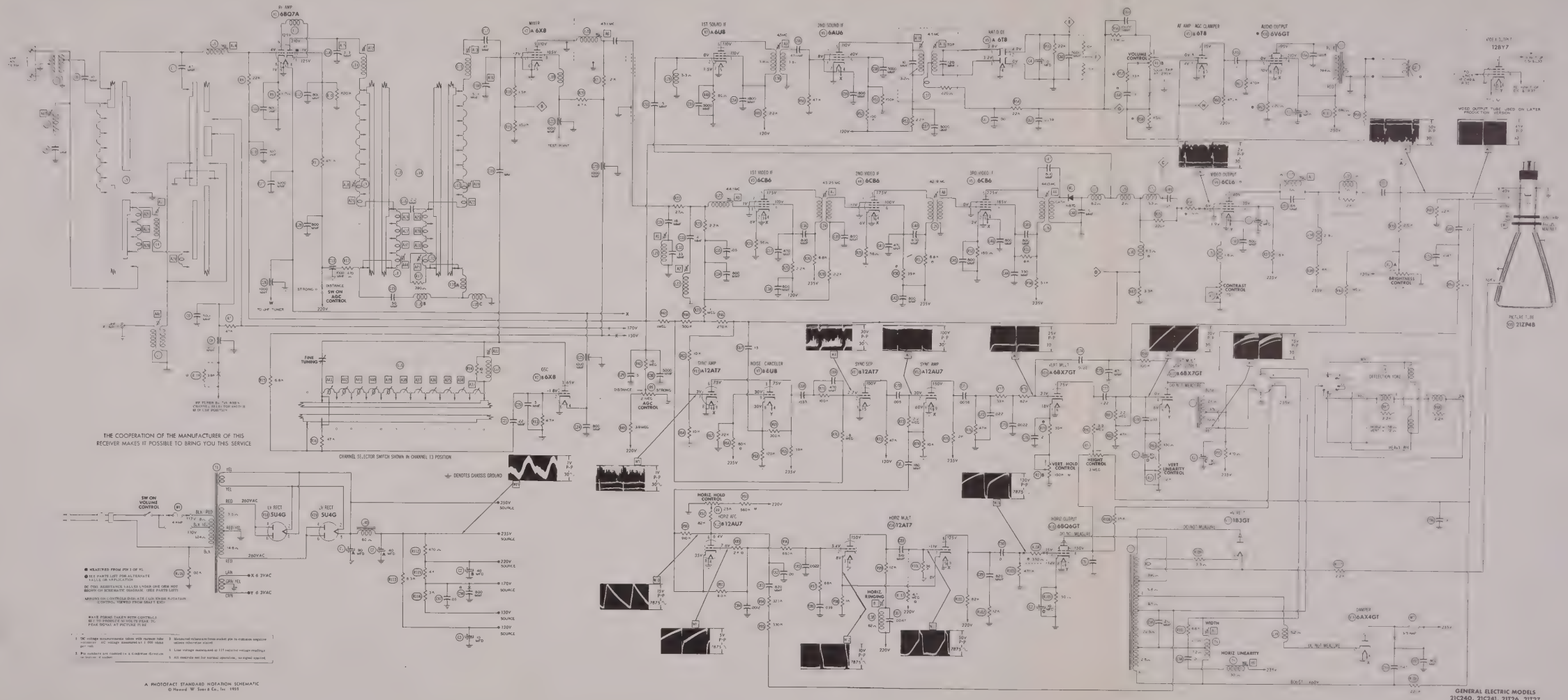
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
DENOTES CHASSIS GROUND
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GENERAL ELECTRIC MODELS
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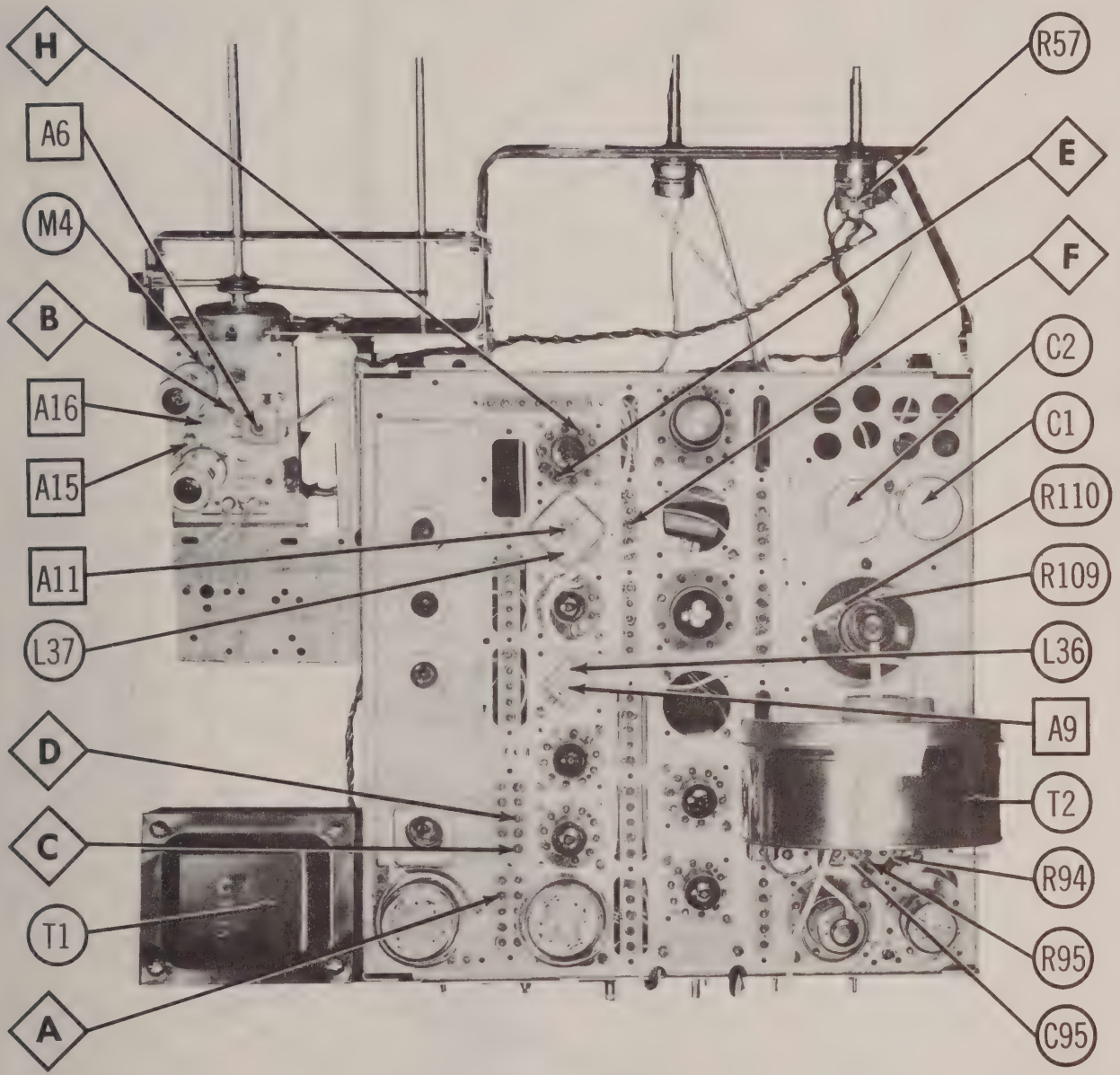
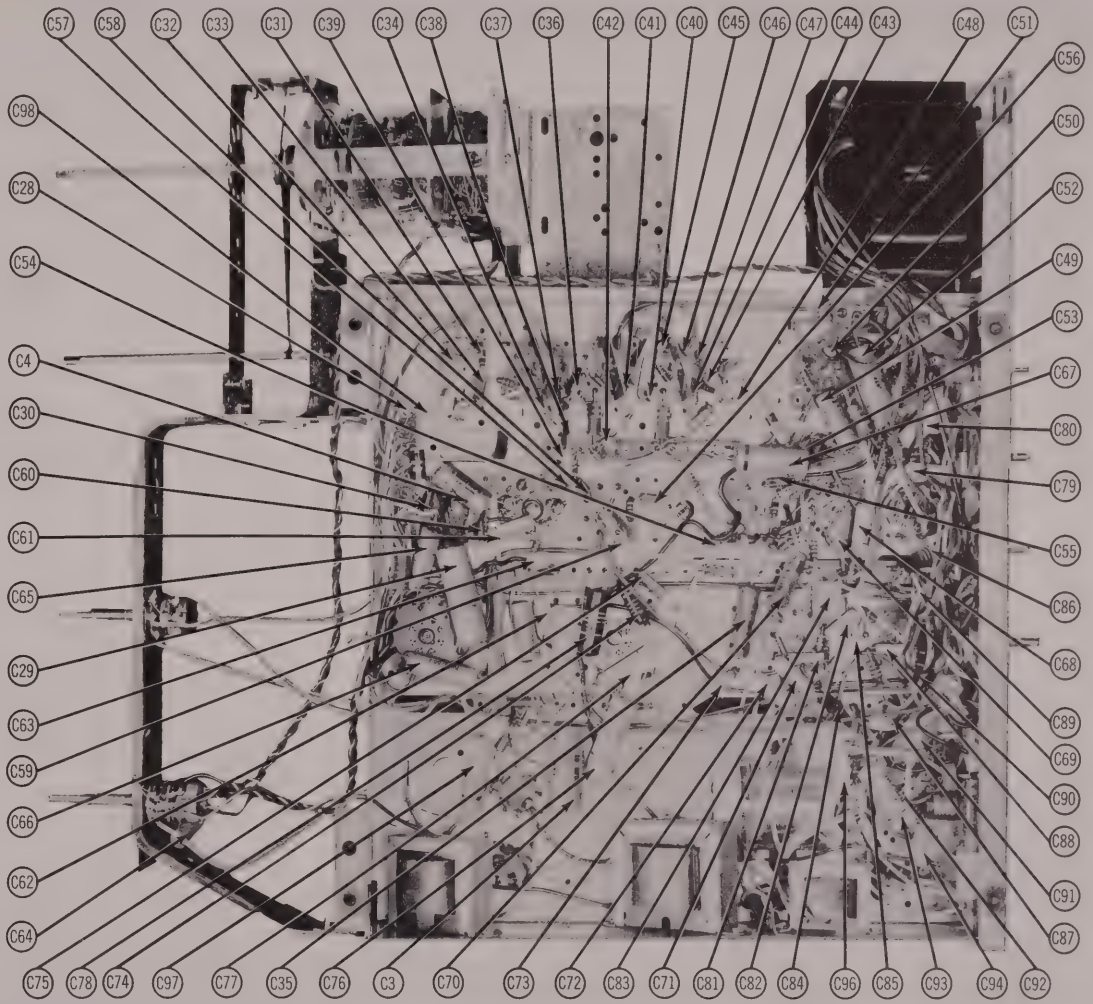


CHASSIS TOP VIEW

SET 264 FOLDER 7



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

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TUBE PLACEMENT CHART

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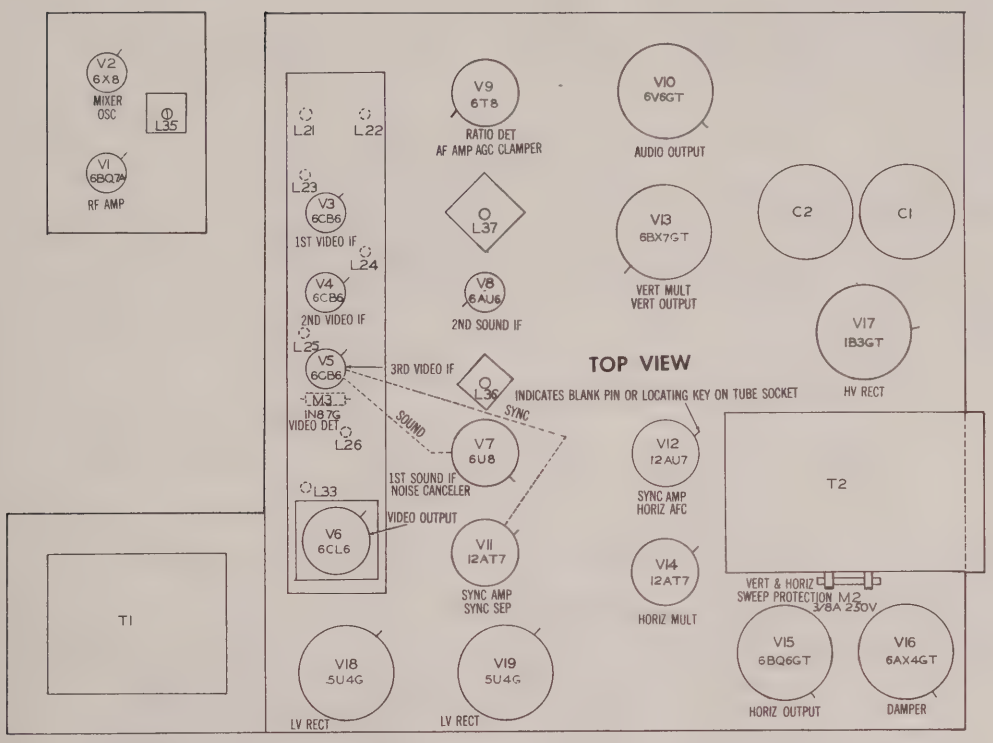


TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **V18, V19, Fuse (M1)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V2, V3, V4, V5**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V6, V20**
Has pic, no sound - **V7, V8, V9, V10**
Overloaded picture - **V9**

SYNC FAILURE
No vert. sync - **V12, V13**
No horiz. sync - **V12, V13, V14**
No vert. or horiz. sync - **V11, V12**

SWEEP FAILURE
No raster, has sound - **V14, V15, V16, V17, V20, Fuse (M2)**
No vertical deflection - **V13**
Poor vert. linearity or foldover - **V13**
Poor horiz. linearity or foldover - **V14, V15, V16**
Narrow picture - **V14, V15, V16, V17, V18, V19**
Vert. off freq. - **V12, V13**
Horiz. off freq. - **V12, V13, V14**

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal output tube (6BQ6/V15) from its socket. Do not remove the horizontal multivibrator tube (V14) to disable the high voltage. Allow a 20 minute warm-up period for receiver and test equipment.

TRAP ALIGNMENT

Turn the volume control and area control maximum counter clockwise. Turn the contrast control maximum clockwise. Remove V11 (12AT7) from its socket.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001MFD	High side to point Ⓖ. Low side to chassis.	Not used	47.25MC (400%Mod)	11, 12 or 13	Vert. Amp. thru 10KΩ to point Ⓒ.	A1	Adjust for MINIMUM 400% indication on scope. If necessary, use maximum scope gain.
2.	"	"	"	41.25MC	"	"	A2	"
3.	"	High side to point Ⓖ. Low side to chassis.	"	4.5MC	"	Vert. Amp. thru detector (Fig.1) to point Ⓐ.	A3	"

VIDEO IF ALIGNMENT

Turn the contrast control to minimum contrast position. Leave V11 out of its socket.
If during adjustment two peaks occur, the correct peak may be obtained by turning the slug fully counter clockwise then clockwise until the first peak appears.
Connect the negative lead of a 4.5 volt bias battery to point Ⓒ. Connect the positive lead to chassis. If the receiver is known to be only slightly misaligned, omit "Video IF Alignment" and continue alignment as outlined under "Overall Video IF Response Check". Use only enough signal generator output to provide usable indication on VTVM.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4.	.001MFD	High side to point Ⓖ. Low side to chassis.	44.15MC (Unmod)	11, 12 or 13	DC probe thru 1Meg to point Ⓓ. Common to chassis.	A4	Adjust for maximum deflection.
5.	"	"	44.1MC	"	"	A5	"
6.	"	"	43.1MC	"	"	A6	"
7.	"	"	42.35MC	"	"	A7	"
8.	"	"	43.9MC	"	"	A8	"

OVERALL VIDEO IF RESPONSE CHECK

The channel selector switch should be set to channel 11, 12 or 13. Select the channel (11, 12 or 13) on which the response curve does not change shape when turning the fine tuning control.
Attenuate the sweep generator output so that .75 volt peak to peak on scope provides 2 inches of vertical deflection.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	.001MFD	High side to point Ⓖ. Low side to chassis.	44MC (10MC Swp)	41.25MC 42.5MC 45.0MC 45.75MC 47.25MC	11, 12 or 13	Vert. Amp. thru 10KΩ to point Ⓒ. Low side to chassis.		Adjust A4 thru A8 to obtain response similar to Fig. 3. A4 and A8 affect low frequency side of response curve and A7 affects positioning of 45.75MC marker. A5 and A6 affect the flat portion or peak region of the response curve. To view the trap region increase the sweep generator output and use high scope gain. If necessary retouch A1 and A2 for MINIMUM marker amplitude at 41.25MC and 47.25MC.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 10KΩ (±1%) resistors in series from point Ⓖ to chassis. The junction of these two resistors is alignment point Ⓖ as shown on the schematic.
If a signal generator providing a 4.5MC signal of crystal accuracy is not available, restore the receiver to normal operating condition and tune in a TV station. Connect the VTVM and adjust A9, A10 and A11 as in steps 10 and 11.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.01MFD	High side to point Ⓖ. Low side to chassis.	4.5MC (Unmod)	Any unused channel	DC probe to point Ⓓ. Common to chassis.	A9, A10	Adjust for maximum deflection.
11.	"	"	"	"	DC probe to point Ⓓ. Common to point Ⓖ.	A11	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Repeat steps 10 and 11.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 130% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	.01MFD	High side to point Ⓖ. Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any unused channel	Vert. Amp. to point Ⓖ. Low side to chassis.	A9, A10	Disconnect stabilizing capacitor C4. Adjust for curve of maximum amplitude and symmetry similar to Fig. 3.
11.	"	"	"	"	"	Vert. Amp. to point Ⓓ. Low side to chassis.	A11	Reconnect stabilizing capacitor C4. Adjust so that 4.5MC occurs at center of cross-over lines as in Fig. 4. SLIGHTLY re-touch A10 for maximum amplitude and straightness of crossover lines.

RF AND MIXER ALIGNMENT

Remove the 300Ω transmission line from tuner input terminals.
Connect the negative lead of a 3 volt bias battery to point Ⓖ. Connect the positive lead to chassis. Remove the 4.5 volt bias battery from point Ⓒ.
If L9, L13 or L19 requires adjustment (normally, adjustment is not required), the tuner cover must be removed and replaced before and after each adjustment.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

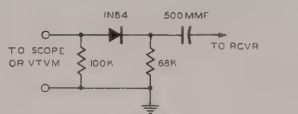


FIG. 1

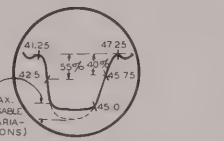


FIG. 2

FIG. 3

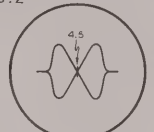
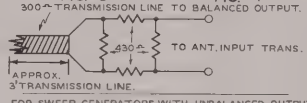
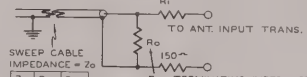


FIG. 4



FOR SWEEP GENERATORS WITH UNBALANCED OUTPUT.



SWEEP CABLE IMPEDANCE = Zo

Zo	Ro	R1
50Ω	56Ω	120Ω
72Ω	82Ω	110Ω
92Ω	110Ω	100Ω

FIG. 5

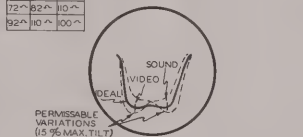


FIG. 6

FIG. 7

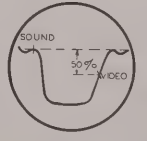


FIG. 8

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Fig. 5	Thru dummy (Fig.5) across primary of antenna input coil (L2).	215MC (15MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 10KΩ to point Ⓒ. Low side to tuner chassis.	A12, A13, A14	Adjust for response of maximum amplitude and symmetry similar to Fig. 6. If tilt exceeds 15% it may be necessary to compress or expand coil turns of L19. Use insulated tool to prevent shorting B+.
13.	"	"	177MC (15MC Swp)	175.25MC 179.75MC	7	"	A15, A16	Adjust for response similar to Fig. 6. If necessary, reposition C12 for maximum gain and equal peaks. SLIGHTLY reposition L8 and L18 (coils whose adjustments are A15 and A16) to obtain desired coupling.
14.	"	"	207MC (15MC Swp) 201MC (15MC Swp) 195MC (15MC Swp) 189MC (15MC Swp) 183MC (15MC Swp)	205.25MC 209.75MC 199.25MC 203.75MC 193.25MC 197.75MC 187.25MC 191.75MC 181.25MC 185.75MC	12 11 10 9 8	"		Check for response curve similar to Fig. 6. If response is not within limits on any high band channel, make compromise adjustments of A12, A13, A14, A15 and A16 with channel switch set to that channel. Recheck all other high band channels to see that they have not been seriously affected.
15.	"	"	85MC (15MC Swp)	83.25MC 87.75MC	6	"	A17, A18, A19	Adjust for maximum amplitude flat topped response curve similar to Fig. 7.
16.	"	"	79MC (15MC Swp)	77.25MC 81.75MC	5	"	A20, A21, A22	If necessary, adjust by compressing or expanding coil turns to obtain response similar to Fig. 7.
17.	"	"	69MC (15MC Swp)	67.25MC 71.75MC	4	"	A23, A24, A25	"
18.	"	"	63MC (15MC Swp)	61.25MC 65.75MC	3	"	A26, A27, A28	"
19.	"	"	57MC (15MC Swp)	55.25MC 59.75MC	2	"	A29, A30, A31	"

OSCILLATOR ALIGNMENT

Remove the bias battery from point Ⓒ and connect a short jumper from point Ⓒ to chassis.
Set the fine tuning control two-thirds turn from its fully counter clockwise position and leave in this position throughout the entire oscillator alignment.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
20.	Fig. 5	Thru dummy (Fig.5) across primary of antenna input coil (L2).	213MC (20MC Swp) 207MC (10MC Swp) 201MC (20MC Swp) 195MC (10MC Swp) 189MC (20MC Swp) 183MC (10MC Swp) 177MC (10MC Swp) 85MC (20MC Swp) 79MC (20MC Swp) 69MC (10MC Swp) 63MC (10MC Swp) 57MC (20MC Swp)	211.25MC 215.75MC 205.25MC 209.75MC 199.25MC 203.75MC 193.25MC 197.75MC 187.25MC 191.75MC 181.25MC 185.75MC 175.25MC 179.75MC 83.25MC 87.75MC 77.25MC 81.75MC 67.25MC 71.75MC 61.25MC 65.75MC 55.25MC 59.75MC	13 12 11 10 9 8 7 6 5 4 3 2	Vert. Amp. thru 10KΩ to point Ⓒ. Low side to chassis.	A33 A34 A35 A36 A37 A38 A39 A40 A41 A42 A43	Adjust to place video marker at 50% on response curve as in Fig. 6. Sound marker should fall in trap notch.

UHF 44MC ALIGNMENT

Connect a short jumper from point Ⓒ to chassis. Leave the fine tuning control set as under "Oscillator Alignment".
Switch the channel selector to "UHF" position.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
21.	Fig. 5	Thru dummy (Fig.5) across UHF input jack.	44MC (10MC Swp)	41.25MC 43.75MC	UHF	Vert. Amp. thru 10KΩ to point Ⓒ. Low side to chassis.	A44, A45, A46	Adjust for response similar to Fig. 6. A44 and A45 affects curve shape. Adjust A46 for maximum amplitude. The spacing between coils whose adjustment is A44 and A45 affects band width. If necessary, reposition these coils. Exercise care so that the coils do not touch each other. Remove the jumper from point Ⓒ to chassis.

UHF TUNER ALIGNMENT

The UHF tuner has been properly aligned at the factory and is very stable. Alignment of this portion is not recommended in the field.

VHF IF TRAP ALIGNMENT

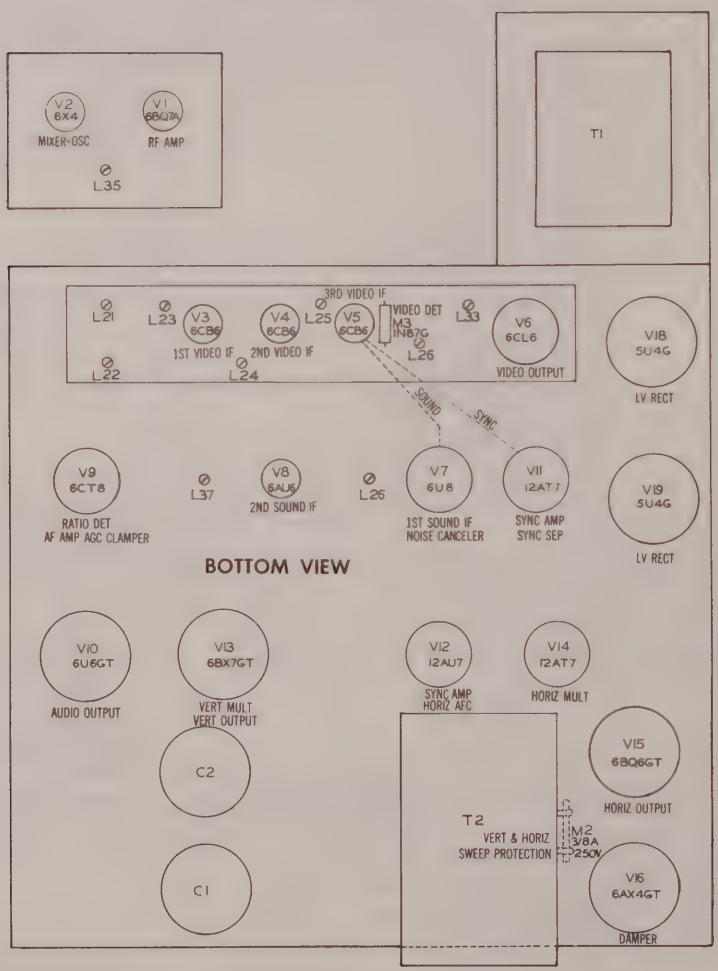
The IF trap (A47) may be aligned by tuning in the station on which the interference occurs and adjusting A47 for minimum interference in the picture. Be careful not to adjust A47 so that it attenuates channel 2 response.
If the frequency of the interfering signal is known, the trap may be aligned as in step 22.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
22.	Fig. 5	Thru dummy (Fig.5) across antenna terminals.	44MC (10MC Swp)	Set to freq. of interfering signal	2	Vert. Amp. thru 10KΩ to point Ⓒ. Low side to chassis.	A47	Connect the negative lead of a 3 volt bias battery to point Ⓒ. Connect the positive side to chassis. Adjust for MINIMUM marker amplitude. Remove bias battery.

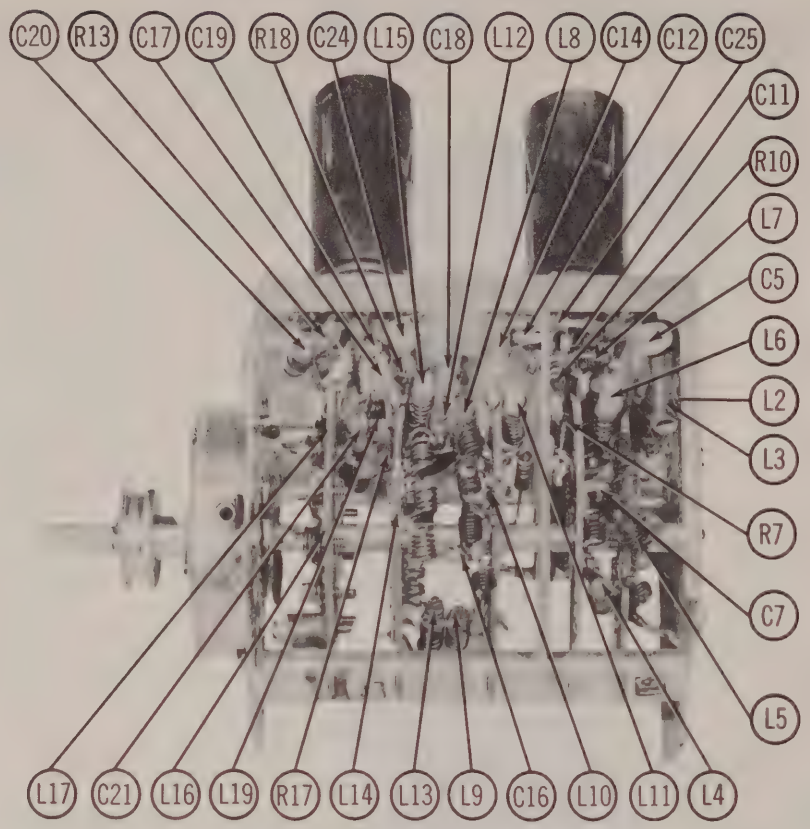
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7A	†1. 2KΩ	200KΩ	INF	. 1Ω	0Ω	INF	1. 4Meg	100Ω	0Ω
V 2	6X8	0Ω	4. 7KΩ	†14. 5KΩ	. 1Ω	0Ω	0Ω	165KΩ	†12. 2KΩ	†8. 5KΩ
V 3	6CB6	1. 4Meg	56Ω	0Ω	. 1Ω	†7KΩ	†10. 5KΩ	0Ω		
V 4	6CB6	1. 4Meg	56Ω	0Ω	. 1Ω	†7KΩ	†39KΩ	0Ω		
V 5	6CB6	0Ω	180Ω	0Ω	. 1Ω	†5KΩ	†23KΩ	0Ω		
V 6	6CL6	100Ω	220KΩ	†18KΩ	0Ω	. 1Ω	†4KΩ	0Ω	†18KΩ	220KΩ
V 7	6U8	†39KΩ	3. 3Ω	†10. 5KΩ	. 1Ω	0Ω	†10. 5KΩ	180Ω	†100KΩ	†50KΩ
V 8	6AU6	47KΩ	0Ω	0Ω	. 1Ω	†10. 5KΩ	†50KΩ	0Ω		
V 9	6T8	2Meg	22KΩ	2Meg	0Ω	. 1Ω	1. 4Meg	0Ω	200KΩ	†470KΩ
V 10	6V6GT	INF	. 1Ω	†1. 3KΩ	†680Ω	470KΩ	INF	0Ω	220Ω	
V 11	12AT7	†50KΩ	2. 5Meg	0Ω	0Ω	0Ω	†39KΩ	7KΩ	0Ω	. 1Ω
V 12	12AU7	†12KΩ	2. 2Meg	10KΩ	0Ω	0Ω	†120KΩ	†2Meg	†1. 2Meg	. 1Ω
V 13	6BX7GT	180KΩ	■5Meg	300KΩ	2. 2Meg	†700Ω	2. 3KΩ	. 1Ω	0Ω	
V 14	12AT7	†13KΩ	†2. 5Meg	1KΩ	0Ω	0Ω	†82KΩ	36KΩ	1KΩ	. 1Ω
V 15	6BQ6GT	INF	0Ω	INF	†15KΩ	470KΩ	150Ω	. 1Ω	150Ω	Top Cap ■24Ω
V 16	6AX4GT	INF	INF	3Meg	INF	†60Ω	INF	0Ω	. 1Ω	
V 17	1B3GT		PINS	1 - 8	HAVE	INFINITE	RESISTANCE			Top Cap ■415Ω
V 18	5U4G	INF	40KΩ	INF	15Ω	INF	15Ω	INF	40KΩ	
V 19	5U4G	INF	40KΩ	INF	14Ω	INF	14Ω	INF	40KΩ	
V 20	21ZP4B	. 1Ω	22KΩ	Pin 10 ■220KΩ	Pin 11 †300KΩ	Pin 12 0Ω				

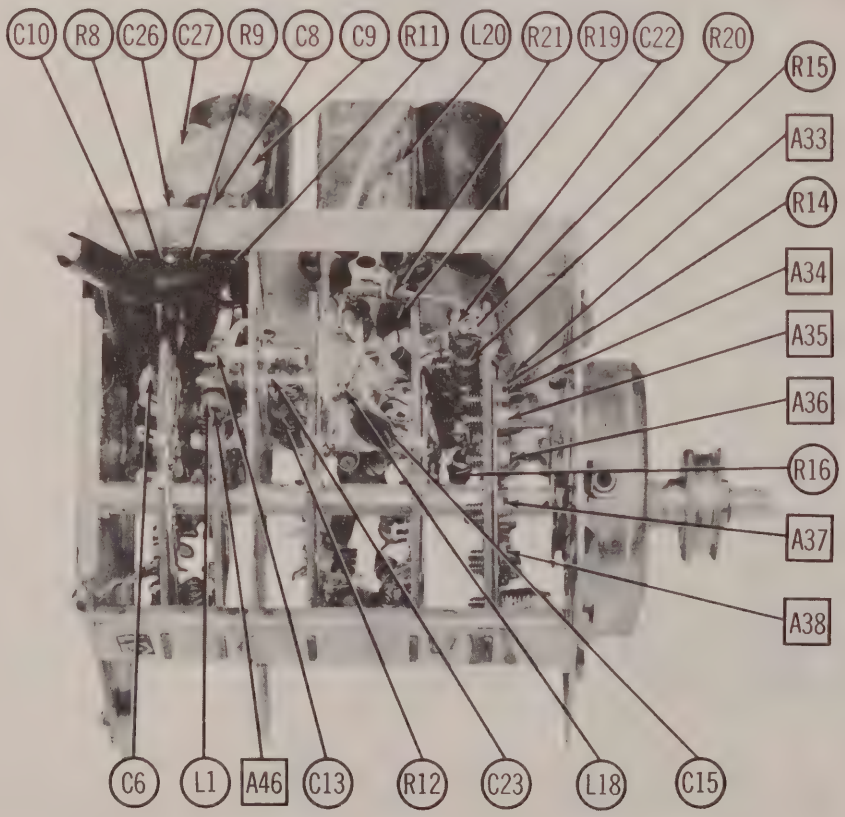
† MEASURED FROM PIN 8 OF V19.
■ MEASURED FROM PIN 3 OF V16.



TUBE PLACEMENT CHART

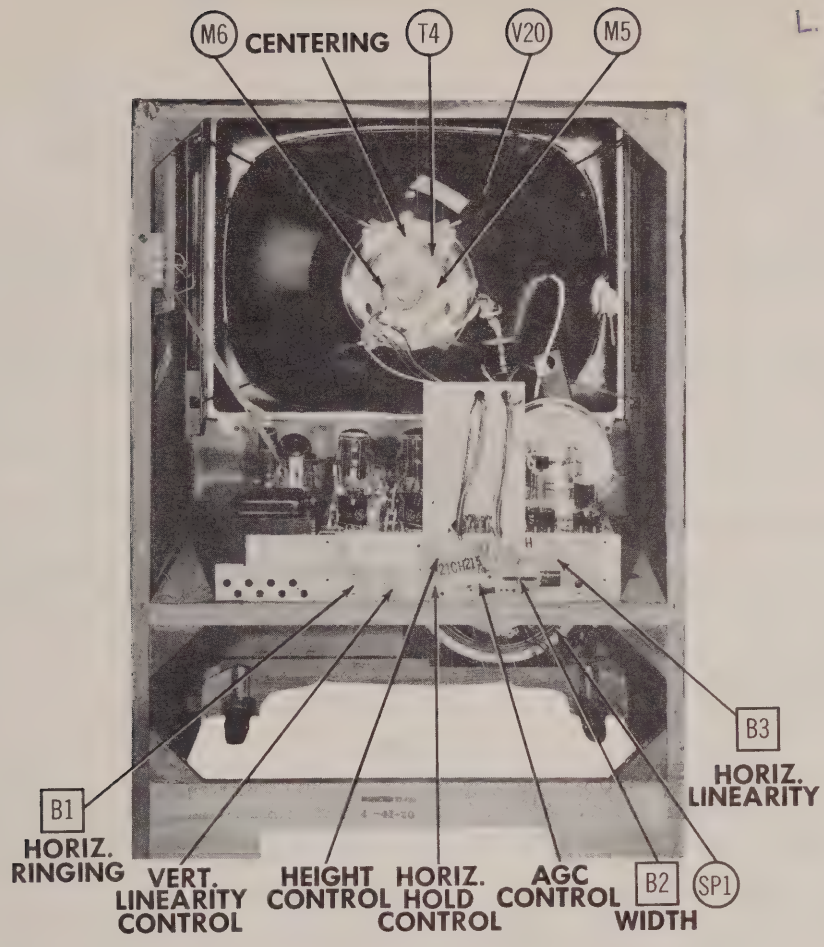


RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE

PROPERTY OF
L. F. BLANKENSHIP
3934 MEADE ST.
DENVER, COLORADO



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Replace V11 and V15 in its socket.

Turn the set on and tune in a TV station preferably a test pattern.

If the picture does not hold sync throughout the complete range of the horizontal hold control, adjust as follows:

1. Replace V12 (12AU7) with a 12AU7 that has pins 6, 7 and 8 clipped off. If a dummy 12AU7 is not available connect a jumper from the center arm of the horizontal hold control to the ungrounded side of C84.
2. Set the horizontal hold control to its mid-range position and adjust the horizontal ringing coil slug (B1) for best sync. Picture will drift slowly from side to side.
3. Turn the horizontal hold control fully clockwise and note the number of diagonal bars present on the screen. Turn the horizontal hold control fully counter clockwise and again note the number of diagonal bars. If necessary, readjust B1 until the number of diagonal bars are the same at both extreme settings of the horizontal hold control.
4. Replace the original 12AU7 in its socket or remove the jumper from the center arm of the horizontal hold control to C84.

Simultaneously adjust the width coil (B2) and the horizontal linearity coil (B3) until the picture is symmetrical from left to right. The picture should be slightly wider than necessary to fill the picture mask horizontally.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V15, V16, V18 and V19. Check T2, T4A, T5, R106, C90 and other associated components. Check adjustments B2 and B3.

DRIVE LINES

Check by substitution V15 and V16. Check adjustments B3. Check C89, C90, C2D, R106, R102, T2, T4A, T5 and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V15 and V16. Check horizontal output and damper stages for component failure or change of value.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V14, V15 and V16. Check C85 for open. Check L38, C87, R99 and other associated components.

XMAS TREE EFFECT

Check by substitution V14, V15 and V16. Check L38, C87, C88, C2D, R105, R99 and R98. Check T2 and T4A for internal arcing.

VERTICAL

LOSS OF SWEEP

Check by substitution V13. Check waveform W7.

If Satisfactory	If Unsatisfactory
Check T3, T4B, R85, C79, C2C and other associated components.	Check C77, R80, R83 and other associated components.

INSUFFICIENT SWEEP

Check by substitution V13. Check height and vertical linearity controls for proper operation. Check T3 and T4B.

COMPRESSED AT BOTTOM

Substitute V13. Check R5, R80, C77 and other associated components.

COMPRESSED AT TOP

Substitute V13. Check R3, R83, C1D, C78 and other associated components.

FOLDS

Substitute V13. Check C77, R81, R82, R83 and other associated components.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V11 and V12. Check C68, C69, C70, R65, R72, R75 and other associated components.

LOSS OF VERTICAL SYNC-HORIZONTAL SYNC SATISFACTORY

Substitute V13. Check C71, C72, C73, C76, C74, R76, R77, R79, R2B and other components associated with V13.

LOSS OF HORIZONTAL SYNC-VERTICAL SYNC SATISFACTORY

Check by substitution V12 and V14. Check C81, C82, R99, L38 and other associated components.

HORIZONTAL BENDING

Check by substitution V11, V12 and V14. Check horizontal AFC network.

VIDEO

LOSS OF VIDEO

Substitute V6. Check C52, C1C, C49, R37, R38, L34 and other associated components.

SOUND BARS (4.5MC BEAT)

Adjust tuner fine tuning for best sound and picture. Check adjustment A3. Check video IF alignment.

POOR CONTRAST

Substitute V6. Check contrast control, picture tube and L32. Check L35, L30, R47, R35 and other associated components.

NEGATIVE PICTURE

Substitute V6. Check picture tube and video detector crystal network. Check C52, L35 and other associated components.

SMEAR

Substitute V6. Check L27, L34, L29, L30, L31, L35, C52 and other associated components.

WIDE BLACK BAR ACROSS PICTURE

Check by substitution V1, V3, V4, V5 and V6 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V7, V8, V9 and V10. Check stages V9 and V10 using audio signal generator. Apply audio signal at Test Point G.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF stages for component failure or change of value.	Check C63, C65, C66, R60, R62, T7, speaker and other associated components.

BUZZ

Adjust tuner fine tuning for best sound and picture. Check adjustment A11 for minimum buzz. If still unsatisfactory check audio IF alignment.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

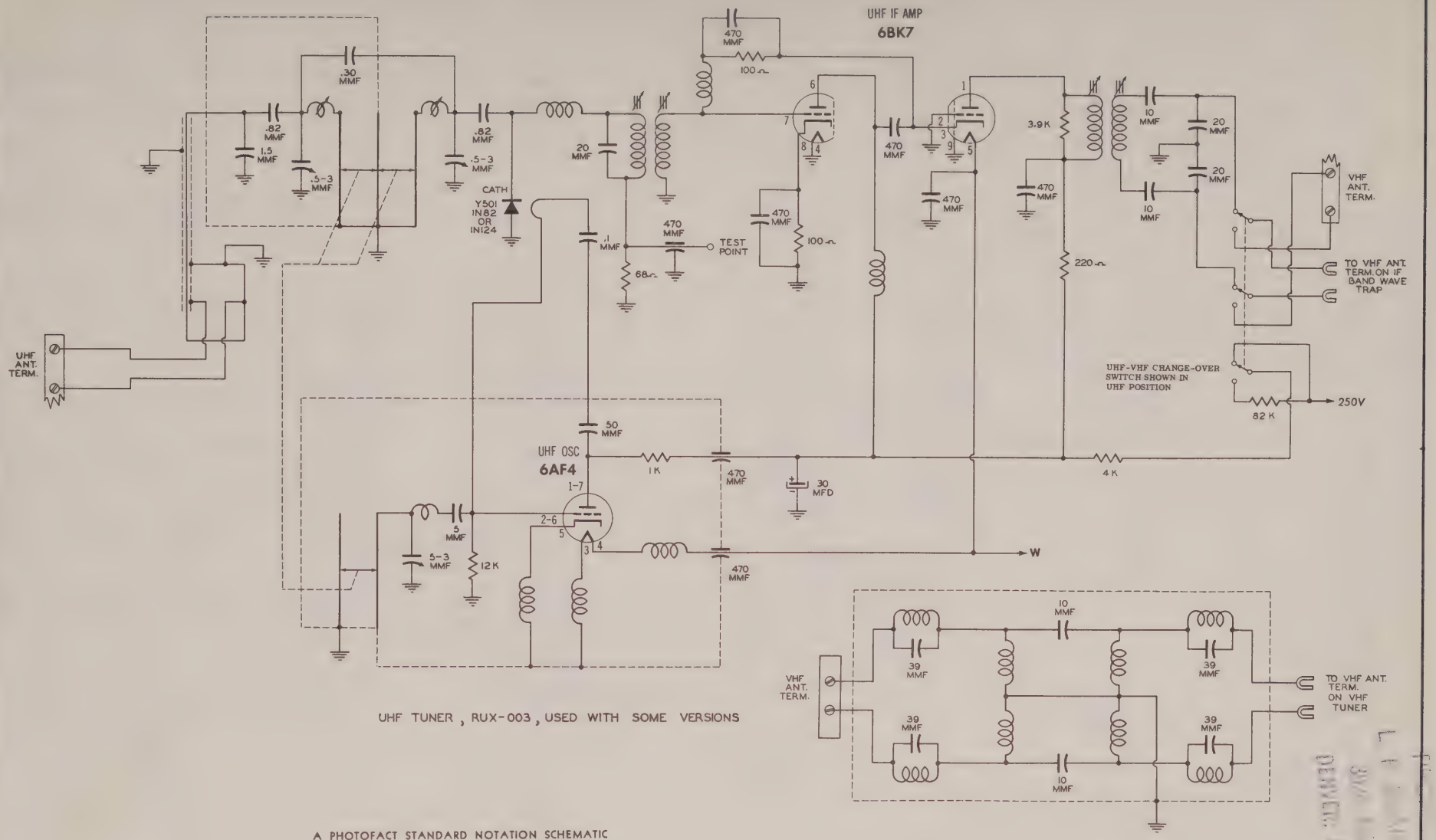
POWER

DEAD SET

If filaments fail to light, check AC interlock assembly. Check M1 fuse. Check switch on volume control and T1. If filaments light, check by substitution V18 and V19. Check B+ filter and decoupling network for component failure or change of value.

SMALL AND/OR DIM PICTURE

Check by substitution V18 and V19. Check B+ filter and decoupling network.



UHF TUNER, RUX-003, USED WITH SOME VERSIONS

IF BAND WAVE TRAP (USED ONLY ON UHF VERSIONS)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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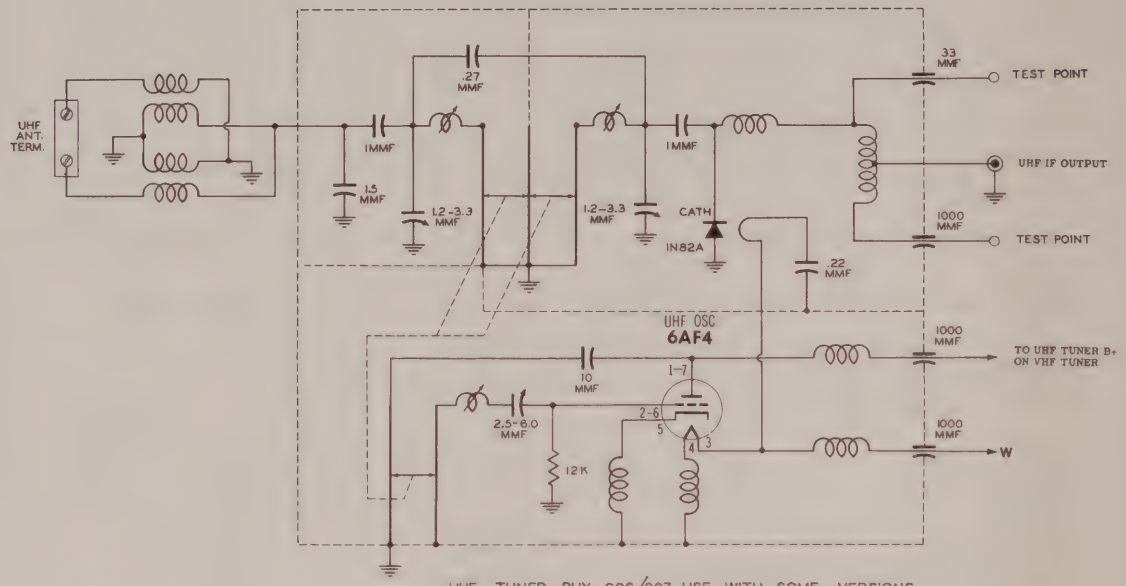
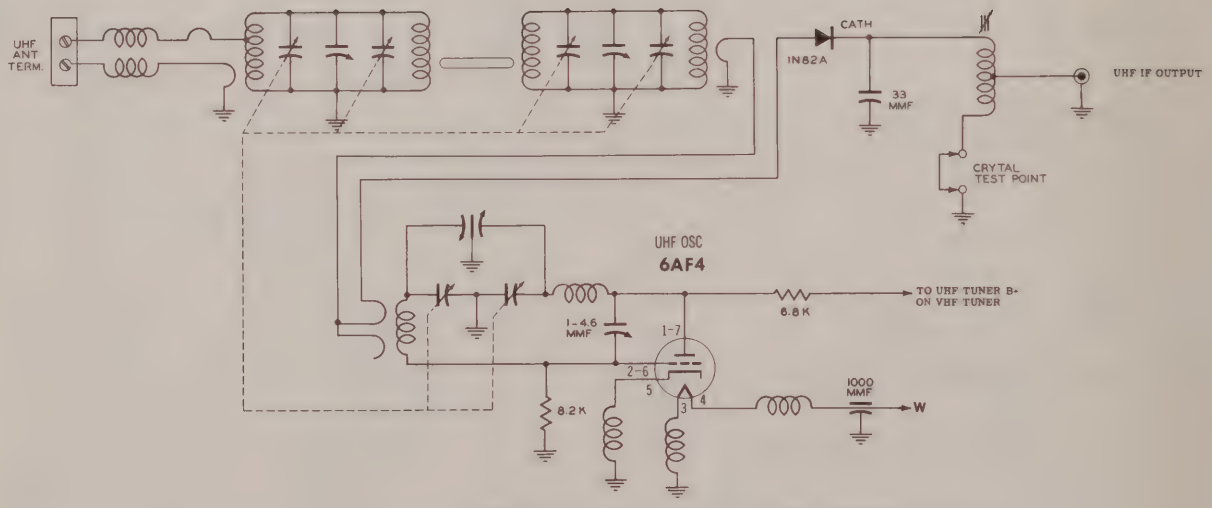
UHF TUNER SCHEMATIC

MODELS 21C240, 21C241, 21T26, 21T27

GENERAL ELECTRIC



UHF TUNER, RUX-006/007, USE WITH SOME VERSIONS



UHF TUNER, RUX 001, USE WITH SOME VERSIONS

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UHF TUNER SCHEMATICS

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		GENERAL ELEC. PART No.	STANDARD REPLACEMENT		
V1	RF Amp.	6BQ7A	6BQ7A	9AJ	
V2	Mixer-Osc.	6X8	6X8	9AK	
V3	1st Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd Video IF Amp.	6CB6	6CB6	7CM	
V6	Video Output	6CL6	6CL6	6CL6	Late production versions use a 12BY7 in this application.
V7	1st Sound IF Amp. - Noise Canceler	6U8	6U8	9AE	
V8	2nd Sound IF Amp.	6AU6	6AU6	7BK	
V9	Ratio Detector - AF Amp. - AGC Clamper	6T8	6T8	9E	
V10	Audio Output	6V6GT	6V6GT	7S	6U6GT used in some versions.
V11	Sync Amplifier - Sync Separator	12AT7	12AT7	9A	
V12	Sync Amplifier Horiz. AFC	12AU7	12AU7	9A	
V13	Vert. Mult. - Vert. Output	6BX7GT	6BX7GT	8BD	
V14	Horiz. Mult.	12AT7	12AT7	9A	
V15	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V16	Damper	6AX4GT	6AX4GT	4CG	
V17	HV Rect.	1B3GT	1B3GT	3C	
V18	LV Rect.	5U4G	5U4G	5T	
V19	LV Rect.	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA					RETMA BASE TYPE	NOTES
	General Elect. PART No.	CBS-HYTRON PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No.		
V20A	21ZP4B	21ZP4B 21ZP4A	21ZP4B 21ZP4A	21ZP4B 21ZP4A 21ZP4 ①	21ZP4B 21ZP4A	12N 12N 12D	① Circuit changes necessary.

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	General Electric PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▰90	350	RCE-163	E4D645				FP420.29	TVL-4625	
B	■30	350								
C	▲5	350								
D	100	75								
C2A	▲40	350	RCE-161	AFH4-52		D077		FP432.4	TVL-4622	
B	■40	350								
C	▲30	350								
D	10	25								
C3	10	350	RCE-188	PRS350/10		BR1045		TC62	TVA-1604	
C4	10	25	RCE-192	PRS25/10		BR102		TC22	TVA-1204	
C5	5			SI5NP0	TCZ-4.7	Z011	NP0K-050	ZT-555	5TCCB-V47	
C6	10			SI10	D6-100	G018	GP1K-100	UC-541	5GA-Q1	
C7	47			BPD-000047	D6-470	G033	801-470	UC-5447	5GA-Q47	
C8	1000			EF-001	MFT-1000				503C-D1	
C9	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C10	800			BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C11	800			BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C12	800			BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C13	1000			EF-001	MFT-1000				503C-D1	
C14	.5-3				829-3		3115-01-0R5	CT565A		
C15	150			BPD-00015	D6-150	G046	GP2K-151	UC-5315	5GA-T15	
C16	2.2			SI2.2NP0	TCZ-2.2	Z006	NP0K-2R2		5TCCB-V22	
C17	47			BPD-000047	D6-470	G033	801-470	UC-5447	5GA-Q47	
C18	.5-3				829-3		3115-01-0R5	CT565A		
C19	.1									
C20	5									
C21	22									
C22	1000			EF-001	MFT-1000				503C-D1	
C23	1000			EF-001	MFT-1000				503C-D1	
C24	800			BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C25	1000			EF-001	MFT-1000				503C-D1	
C26	1000			EF-001	MFT-1000				503C-D1	
C27	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C28	800		RCW-3037	BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C29	.5	200	RCC-016	P288-5		CUB2P5		PT405	2TM-P5	
C30	5000		RCW-3014	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C31	16	500								
C32	33	500		1469-330		22R5Q33				
C33	4	500								
C34	800		RCW-3037	BPD-0008	DD-801	K069	801-001	DC-525	5HK-D5	
C35	.05	200	RCC-086	P288-05	DF-503	CUB2S5		PT415	2TM-S5	
C36	800		RCW-3037	BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C37	470		RCW-3097	SI470	D6-471	TP46	GP2K-471	UC-5347	5GA-T47	
C38	800		RCW-3037	BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C39	800		RCW-3037	BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C40	800		RCW-3037	BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C41	470		RCW-3097	SI470	D6-471	TP46	GP2K-471	UC-5347	5GA-T47	
C42	800		RCW-3037	BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C43	800		RCW-3037	BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C44	330		RCW-3162	SI330	D6-331	TP43	GP2K-331	UC-5333	5GA-T33	
C45	800		RCW-3037	BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C46	800		RCW-3037	BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C47	800		RCW-3037	BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C48	5		RCW-3113	SI5NP0	TCZ-4.7	Z010	NP0K-050	ZT-555	5TCCB-V47	
C49	.05	200	RCC-105	P288-05	DF-503	CUB2S5		PT415	2TM-S5	
C50	800		RCW-3037	BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C51	68	500	UCG-2024	1469-680		22R5Q68				
C52	.1	600	RCC-047	P688-1	DF-104	CUB6P1		PT601	6TM-P1	
C53	5		RCW-3113	SI5NP0	TCZ-4.7	Z010	NP0K-050	ZT-555	5TCCB-V47	

CAPACITORS (cont)

ITEM No.	RATING CAP	VOLT	"GENERAL" Electric PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C54	1800		RCW-3107	S2B00	D6-182	TP85	GP2L-182	UC-S218	5HK-D18	
C55	5000		RCW-3014	BPD-008	DD-502	K060	81L-006	DC-S25	5HK-D6	
C56	47	500	RCU-320	1455-00005	D6-470	5WG47	GP1K-470	MC235	1FM-45	
C57	5000		RCW-3014	BPD-008	DD-502	K060	81L-006	DC-S25	5HK-D5	
C58	5000		RCW-3014	BPD-008	DD-502	K060	81L-006	DC-S25	5HK-D6	
C59	800		RCW-3037	BPD-0008	DD-801	K069	80L-001	DC-S21	5HK-D1	
C60	5000		RCW-3014	BPD-008	DD-502	K060	81L-006	DC-S25	5HK-D5	
C61	.001	600	UCC-085	P588-001	D6-102	CUB4DI	GP2L-102	PT621	6TM-D1	
C62	.0039	600	UCC-088	P588-004	D6-402	CUB4D4	GP2-333-402	PT624	6TM-D4	
C63	10000		RCW-3084	BPD-01	DD-103	K083	82L-01	DC-S11	5HK-B1	
C64	.01	200	UCC-040	P488-01	D6-103	CUB4S1	GP2-333-103	PT611	4TM-S1	Note 1
C65	.01	600	RCC-049	P588-01	D6-103	CUB4S1	GP2-333-103	PT611	6TM-S1	
C66	.056	1000		CUB1E6		CUB1E6		PT1E6	MD-D6	
C67	.15	200	RCC-131	P288-15		CUB2P15		PT2015	2TM-P15	
C68	.0033	600	RCN-066	P668-0033	D6-332	CUB6D33	GP3-333-332	PT6233	6TM-D33	
C69	.470	500	RCN-066	1469-471		5HT47		MCB345	MB-35	
C70	.005	600	RCC-044	P668-005	D6-502	CUB6D5	GP3-333-502	PT6235	6TM-D5	
C71	.0056	600	RCN-067			PM6D56				
C72	.022	600	RCN-062			PM6S22				
C73	.0022	600	RCN-060	1464-222		IR5D22				
C74	.0022	600	RCN-060	1464-222		IR5D22				
C75	470	500	RCU-322	1469-471		5RT47		MCB345	MB-35	
C76	.2	200	UCC-050	P488-22		CUB2P22		PT2022	2TM-P22	
C77	.022	600	RCC-050	P688-022	DF-303	CUB6S22	81T-05	PT6322	6TM-S33	
C78	.033	600		P688-033		PM6S33		PT6133	6TM-D33	
C79	.0047	600	RCN-051	P688-0047	D6-472	CUB6D47	GP3-333-472	PT6247	6TM-D47	
C80	.023	600	RCN-059	P688-023	DF-303	CUB6S22	81T-05	PT6133	6TM-S33	
C81	180	600	RCU-335	1469-181		2ER5T18				
C82	.001	600	RCN-063	P688-001	D6-102	CUB6D1	GP2L-102	PT631	6TM-D1	
C83	820	500	RCU-332	1464-821		5RT82				
C84	.0012	600	RCC-115	1464-122		IR5D12				
C85	.0022	600	RCN-060	P688-0022	D6-322	CUB6D22	GP3-333-322	PT6222	6TM-D22	
C86	.039	300	RCN-096			PM4S39				
C87	.0047	600	RCN-051	1464-472		IR5D47		MCB465	MB-35	
C88	510	500	UCC-2045	1469-511		5RT51				
C89	620	500	RCU-316	1469-621		5RT62				
C90	.01	600	RCN-055	P588-01	D6-103	CUB6S1	GP3-333-103	PT611	6TM-S1	
C91	.1	600	UCC-048	P588-1	DF-104	CUB6P1		PT601	6TM-P1	
C92	800		RCW-3037	BPD-0008	DD-801	K069	80L-001	DC-S21	5HK-D1	
C93	.047	600		P688-047		CUB6S47		PT6147	6TM-S47	
C94	.01	500	RCN-025	P686-01		CUB6S1		PT611	6TM-S1	
C95	210	3000	RCW-3138							
C98	.01	1000	RCN-030	P1068-01	DD16-103	CUB16S1		PT1S01	MB-S1	
C97	.05	600	UCC-045	P668-05	DF-503	CUB6S5		PT615	6TM-S5	
C98	800		RCW-3037	BPD-0008	DD-801	K069	80L-001	DC-S21	5HK-D1	Note 2

Note 1. Used in console models only.
Note 2. Not used in all versions.

CONTROLS

ITEM No.	RATING RESIST ANCE	WATTS	REPLACEMENT DATA General Elect. PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	700Ω	½	RRC-386 ■	◆QJ-595	RTV-489	F3-2	UF13L	Contrast-Panel
B	500KΩ	½				R2-46	UR55T254	† Volume tapped at 370KΩ-Rear
C	Switch					KB-1	UB-26	Attach to R1B
R2A	100KΩ	½	RRC-352	*QJ-593	RTV-487	F1-31	UK-1190	Brightness-Panel
B	150KΩ	½				R2-32		Vert. Hold-Rear Note
R3A	20000	3	RRC-306	WK-2000		VK-131	R3500L	Vert. Linearity Wire Wound
B	Shaft		Not Req.	Not Req.		Not Req.	Not Req.	Attach to R3A
R4A	25KΩ	½	RRC-376	QJ-130	A47-25K-S	AB-26	SU-29	Horiz. Hold
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R4A
R5A	3Meg	½	RRC-246	QJ-140	A47-3Meg-S	AB-84	U-56	Height
B	Shaft		Not Req.	Not Req.	KS-1	AK-4	Not Req.	Attach to R5A
R6A	2Meg	½	RRC-289		A47-2Meg-S	AB-75	U-56	AGC
B	Shaft		Not Req.		FKS-1/4	AK-1	Not Req.	Attach to R6A
C	Switch		Not Req.		SWK-13	KB-1	U5-26	Attach to R5A

† Universal replacement (Mallory exact duplicate part no. UEUS)
◆ CONCENTRIKIT EQUIVALENT: KIT K-2, BASE ELEMENTS & SHAFTS: B1T-105 & P1-12T(PANEL)
B1S-1533 & R2-216 (REAR)
76-1 SWITCH
■ Models 21T28 and 21T37 use control part no. RRC-287.
Note . Later production models use 100KΩ control (part #RCC-308).

RESISTORS

ITEM No.	RATING OHMS	WATT	REPLACEMENT DATA General Elect. PART No.	IRC PART No.	NOTES
R7	47KΩ	½	URD-089	BTS-47K	
R8	22KΩ	½	URD-081	BTS-22K	
R9	100Ω	½	URD-025	BTS-100	
R10	820KΩ	½	URD-119	BTS-820K	
R11	470KΩ	½	URD-113	BTS-470K	Note 1
R12	470Ω	½	URD-041	BTS-470	Note 8
R13	4700Ω	½	URD-065	BTS-4700	
R14	10KΩ	½	URD-073	BTS-10K	
R15	6800Ω	1	URE-069	BTA-6900	
R16	47KΩ	½	URD-089	BTS-47K	
R17	390Ω	½	URD-039	BTS-390	Note 12
R18	15KΩ	½	URD-077	BTS-15K	
R19	150KΩ	½	URD-101	BTS-150K	
R20	4700Ω	½	URD-065	BTS-4700	
R21	1200Ω	½	URD-053	BTS-1200	
R22	27Ω	½	URD-011	BTS-27	
R23	2200Ω	½	URD-057	BTS-2200	
R24	56Ω	½	URD-017	BTS-56	
R25	2200Ω	½	URD-057	BTS-2200	
R26	6800Ω	2	URF-069	BTB-6800	
R27	1Meg	½	URD-121	BTS-1Meg	
R28	2200Ω	1	URD-057	BTS-2200	
R29	56Ω	½	URD-019	BTS-56	
R30	39KΩ	½	URD-087	BTS-39K	
R31	6800Ω	2	URF-069	BTB-6800	
R32	180Ω	½	URD-029	BTS-180	
R33	18KΩ	½	URD-079	BTS-18K	
R34	5600Ω	1	URE-1068	BTA-5600	
R35	220KΩ	½	URD-105	BTS-220K	
R36	10Ω	½	URD-001	BTS-10	
R37	18KΩ	2	URF-079	BTB-18K	
R38	4000Ω	10	RRW-053	PW10-4000	
R39	270KΩ	½	URD-107	BTS-270K	
R40	1Meg	½	URD-121	BTS-1Meg	
R41	22KΩ 5%	½	URD-1081	BTS-22K 5%	
R42	10Meg	½	URD-145	BTS-10Meg	
R43	1Meg	½	URD-121	BTS-1Meg	
R44	300KΩ 5%	½	URD-1098	BTS-300K 5%	

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING OHMS	WATT	REPLACEMENT DATA General Elect. PART No.	IRC PART No.	NOTES
R45	3.9Meg	½	URD-135	BTS-3.9Meg	
R46	270KΩ	½	URD-107	BTS-270K	
R47	330KΩ	½	URD-061	BTS-330K	
R48	180Ω	½	URD-031	BTS-180	
R49	2200Ω	½	URD-057	BTS-2200	
R50	47KΩ	½	URD-089	BTS-47K	
R51	100KΩ	½	URD-097	BTS-100K	
R52	100KΩ	½	URD-097	BTS-100K	
R53	2200Ω	½	URD-057	BTS-2200	
R54	22KΩ	½	URD-081	BTS-22K	
R55	22KΩ	½	URD-081	BTS-22K	
R56	1.5Meg	½	URD-125	BTS-1.5Meg	
R57	33KΩ	½	URD-085	BTS-33K	Note 2
R58	47Ω			BTS 47	Note 2
R59	120Ω		URD-027	BTS-120	Note 2
R60	470KΩ	½	URD-113	BTS-470K	
R61	470KΩ	½	URD-113	BTS-470K	
R62	220Ω	1		BTA-220	Note 3
R63	10KΩ	½	URD-073	BTS-10K	
R64	10KΩ	½	URD-073	BTS-10K	
R65	39KΩ	½	URD-087	BTS-39K	
R66	180KΩ 5%	½	URD-1103	BTS-180K 5%	
R67	22KΩ 5%	½	URD-1081	BTS-22K 5%	
R68	120KΩ 5%	½	URD-1099	BTS-120K 5%	
R69	300KΩ 5%	½	URD-1108	BTS-300K 5%	Note 11
R70	1.5Meg	½	URD-125	BTS-1.5Meg	
R71	100KΩ	½	URD-097	BTS-100K	
R72	47KΩ	½	URD-089	BTS-47K	
R73	2.2Meg	½	URD-129	BTS-2.2Meg	
R74	10KΩ	½	URD-073	BTS-10K	
R75	12KΩ	½	URD-075	BTS-12K	
R76	47KΩ	½	URD-089	BTS-47K	
R77	33KΩ	½	URD-085	BTS-33K	
R78	82KΩ	½	URD-095	BTS-82K	
R79	150KΩ 5%	½	URD-1099	BTS-150K 5%	Note 4
R80	3.9Meg	½	URD-135	BTS-3.9Meg	
R81	2.2Meg	½	URD-129	BTS-2.2Meg	

ITEM No.	RATING OHMS	WATT	REPLACEMENT DATA General Elect. PART No.	IRC PART No.	NOTES
R82	47KΩ	½	URD-089	BTS-47K	
R83	33KΩ	½	URD-085	BTS-33K	
R84	330KΩ	½	URD-061	BTS-330K	
R85	470Ω	½	URE-041	BTA-470	
R86	4700Ω	½	URD-065	BTS-4700	
R87	2200Ω	½	URD-057	BTS-2200	
R88	2200Ω	½	URD-057	BTS-2200	
R89	20000Ω 5%	½	URD-1056	BTS-20000 5%	Note 10
R90	910KΩ 5%	½	URD-1120	BTS-910K 5%	
R91	910KΩ 5%	½	URD-1120	BTS-910K 5%	
R92	82KΩ	½	URD-095	BTS-82K	
R93	560KΩ 5%	½	URD-1115	BTS-560K 5%	Note 9
R94	330KΩ	½	URD-109	BTA-330K	
R95	330KΩ	1	URE-109	BTA-330K	
R96	680KΩ	½	URD-117	BTS-680K	
R97	68KΩ	½	URD-063	BTS-68K	
R98	1000Ω	½	URD-049	BTS-1000	
R99	12KΩ	1	URE-075	BTA-12K	
R100	36KΩ 5%	½	URD-1026	BTS-36K 5%	
R101	82KΩ	½	URD-095	BTS-82K	
R102	12KΩ	½	URD-075	BTS-12K	
R103	470KΩ	½	URD-113	BTS-470K	
R104	330Ω	½	URD-037	BTS-330	
R105	150Ω	4	RRW-120	1 3/4A-150	
R106	15KΩ	2	URF-1077	BTB-15K	
R107	6800Ω	2	URF-069	BTB-6800	
R108	220KΩ	½	URD-105	BTS-220K	
R109	3.3Ω	½	RRW-105		
R110	2200Ω	½	URD-057	BTS-2200	
R111	680Ω	2	URF-405	BTB-680	
R112	470Ω	1	URE-041	BTA-470	
R113	8200Ω	5	RRW-111	1 3/4A-8500	
R114	3000Ω	1	URE-1060	BTA-3000	
R115	4000Ω	5	RRW-101	1 3/4A-4000	
R116	100KΩ	2	RRF-001	BTB-100K	
R117	5.7MΩ	½	URD-157	BTS-5.7Meg	Note 6
R118	3.9KΩ	2	URD-063	BTB-3.9K	Note 7

Note 1. Some early versions may use a 3900Ω resistor in this application; later production versions use a 47KΩ resistor in this application.
Note 2. Use in console models only.
Note 3. Console models use 220Ω resistor, other models use 470Ω resistor.
Note 4. Some early versions may use a 120KΩ resistor in this application. Later production versions use 250KΩ resistor in this application.
Note 5. Not used in later production.
Note 6. Used in later production only.
Note 7. Use only in later production UHF models. When UHF tuner model RUK-006 or RUK-007 is used, a 3.9KΩ resistor is used in this application. When UHF tuner Model RUK-001 is used, a 2.2KΩ resistor is used in this application.
Note 8. Later production versions use a 10 KΩ resistor in this application.
Note 9. Later production versions use a 680KΩ resistor in this application.
Note 10. Later production versions use a 30000 resistor in this application.
Note 11. Later production versions use a 220KΩ resistor in this application.
Note 12. Not used when V6 is 12BY7.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	General Electric PART No	Stancor PART No	Merit PART No	Triad PART No	RCA TYPE No.	Halldorson PART No.	Thordorson PART No.
T2	Horiz. Output Trans.	RTO-150						
T3	Vert. Output Trans.	RTO-151					26S70 ① ⑦	
T4A	Yoke-Horiz. (12MH) ②	RLD-053 ③	A-S147①					
B	Vert (40MH)							
T5	Horiz. Linearity (4.5-17MH)	RLD-060	WC-5⑥⑧	MWC-1 ④ ⑥	WC-13 ⑧	RF800 ④ ⑥	WC-18 ④	
T6A	Width-(.17-1.5MH)	RLD-058						
B	(1.5-8.5MH)							

① Drill one new mounting hole.
② Horiz. windings parallel connected.
③ Includes resistors R87, and R88.
④ Enlarge mounting hole.
⑤ Connect to coded red and blue terminals.
⑥ Connect to coded #1 and #2 terminals.
⑦ Connect as sub trans.
⑧ Use new mounting hole.

TRANSFORMER (POWER)

ITEM No	RATING PRI	SEC 1	SEC 2	SEC 3	SEC 4	SEC 5	General Electric PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordorson PART No.
T1	117VAC	534VCT @ 2.03A	515VAC @ .320ADC	12.6VCT @ 4.9A			RTP-321	P-8167①②				P9739①②	

① Drill one new mounting holes.
② Series 5.2V windings for Sec. #3

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	SEC.	General Electric PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordorson PART No.	NOTES
T7	5.1KΩ	3.3Ω	RTO-140 or RTO-139	A-3877	A-3930	S-3X	21000	24851	

SPEAKER

ITEM No.	RATINGS SIZE	FIELD	V. C. IMP.	General Electric PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1	10" 61"	PM PM	3.3Ω 3.3Ω	ROP-018 260007 ①	10J1 SJ6	10AS1 SA1	① Used in models 21T26 and 21T27

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA General Electric PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No	NOTES
L1	UHF IF Trans.	0Ω	0Ω	RTL-184				
L2	VHF Ant. Trans.	00CT	0Ω	RLA-042				
L3	VHF IF Trans.	0Ω		RLJ-284				
L4	VHF Ant. Coil	0Ω		RRK-046				Channel 6 position, part of wafer assembly
L5	VHF Ant. Coils	0Ω		RRK-046				
L6	VHF Ant. Coil	0Ω		RRK-046				Channel 13 position
L7	VHF Neut. Coil	0Ω		RLJ-289				
L8	UHF RF Coil	0Ω		RRK-044				Part of wafer assembly
L9	VHF RF Coil	0Ω		RRK-044				Channel 6 position, part of wafer assembly
L10	VHF RF Coils	0Ω		RRK-044				Part of wafer assembly
L11	VHF RF Coil	0Ω		RRK-044				Channel 13 position, part of wafer assembly
L12	UHF Mixer Grid Coil	0Ω		RRK-043				Part of wafer assembly
L13	VHF Mixer Grid Coil	0Ω		RRK-043				Channel 6 position, part of wafer assembly
L14	VHF Mixer Grid Coils	0Ω		RRK-043				Part of wafer assembly
L15	VHF Mixer Grid Coil	0Ω		RRK-043				Channel 13 position, part of wafer assembly
L16	VHF Osc. Coils	0Ω		RRK-042				Part of wafer assembly
L17	VHF Osc. Coil	0Ω		RRK-042				Channel 13 position, part of wafer assembly
L18	VHF Hi-Band Coupling	0Ω		RLJ-288				
L19	VHF RF Choke	0Ω		RLI-288				
L20	VHF Conv. Plate	.1Ω		RLJ-285				
L21	47.25MC Trap	0Ω		RLJ-279	17-4502 *			
L22	41.25MC Trap	.1Ω		RLJ-278	17-4500 *			
L23	1st. Video IF	.1Ω		RLJ-182	17-4500 ■		6218 ▲	
L24	2nd. Video IF	0Ω	0Ω	RTL-144	17-4523		6219	
L25	3rd. Video IF	0Ω	0Ω	RTL-146	17-4523		6219	
L26	4th. Video IF	.1Ω	.1Ω	RTJ-154	17-4524			
L27	Series Peaking Coil	8.3Ω		RLJ-138	19-1006		4613	10 Microhenries, IRC part no. CL-1
L28	Shunt Peaking Coil	3.3Ω		RLJ-280	19-7068		4630	68 Microhenries
L29	Series Peaking Coil	2Ω		RLP-294	19-3098	TV-190	6170	31 Microhenries
L30	Shunt Peaking Coil	6.5Ω		RLJ-197	19-3250	TV-185	6254	220 Microhenries Note 1
L31	Series Peaking Coil	3.3Ω		RLJ-280	19-7068		4630	68 Microhenries
L32	Cathode Choke	1.6Ω		RLJ-123	19-1003		4606	2.2 Microhenries, IRC part no. CLA
L33	4.5MC Trap	1Ω		RLJ-177	17-3401 ▲	TV-151	1669	Note 2
L34	Shunt Peaking Coil	2.8Ω		RLJ-280	19-7068		4630	68 Microhenries
L35	Series Peaking Coil	7Ω		RLJ-306	19-3180 ▲	TV-184 ▲	6180 ▲	180 Microhenries, wound on 120Ω resistor. Note 3
L36	Sound IF	3.8Ω	3.8Ω	RLJ-280	17-1021 ●	TV-106 ●	1666 ●	Includes 220Ω resistor
L37	Ratio Detector	3.2Ω	.5Ω	RTD-015	17-3493 †	TV-110 †	1668 †	
L38	Ringing Coil	62Ω		RLJ-247	19-1576 ♦	TV-163 ♦	6210 ♦	
L39	RF Choke	8.3Ω		RLJ-138	19-1005		4613	10 Microhenries, IRC part no. CL-1

* Use trap winding only.
■ Debug trap winding.
▲ Use one winding only.
● Drill new mounting hole.
▬ Parallel with 12KΩ resistor.
† Drill mounting holes and add 220Ω resistor externally.
♦ Enlarge mounting hole.

Note 1. When V6 is 12BY7, L30 is changed to part no. RLJ-315.
Note 2. When V6 is 12BY7, L33 is changed to part no. RLJ-316.
Note 3. When V6 is 12BY7, L35 is changed to part no. RLJ-304.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (@ CURRENT 1000 ᴰᶜ)	REPLACEMENT DATA General Electric PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordorson PART No.
L40	.330A	60Ω	L 62HY	RLF-063	C-2336①			C5037	36C44

① Drill one new mounting hole.

FUSES

ITEM No.	TYPE	RATING	General Electric PART No. FUSE	General Electric PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER	NOTES
M1	3AG	4A	REF-010	RJB-049	313004	350038	MDX4		
M2	3AG Slo/Blo 3AG	125V 3/8A 250V	REF-013	RMC-053*	(4A-3AG-S/B) 312. 375 (3/8A-3AG)	121004*	AGC 3/8	4440*	

* Two used.

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA General Electric PART No.	SYLVANIA PART No.	FEDERAL PART No.	NOTES
M3	1N87G	RED-001	1N60		Video Det.

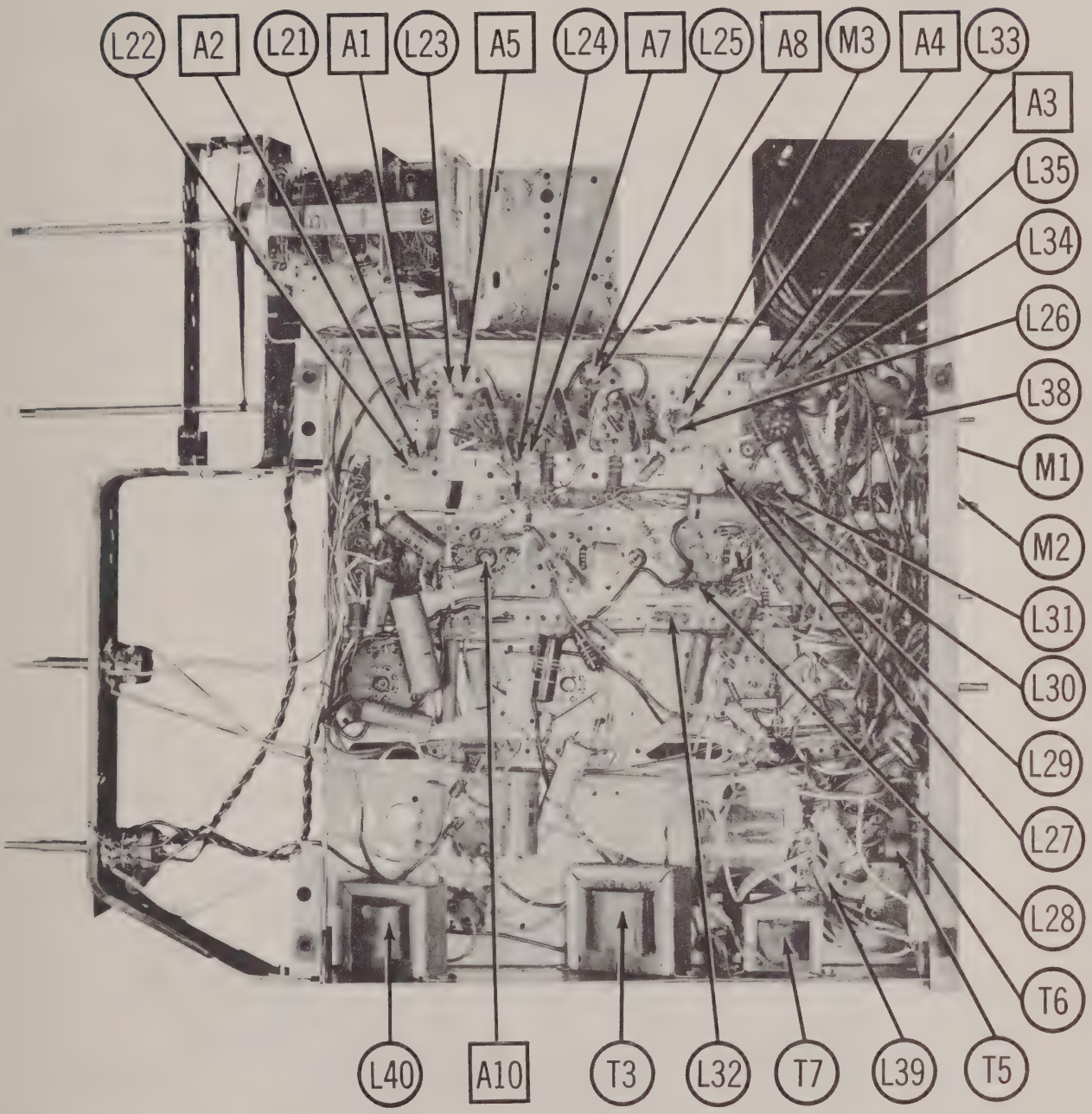
...RSHIP
3924 ... ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

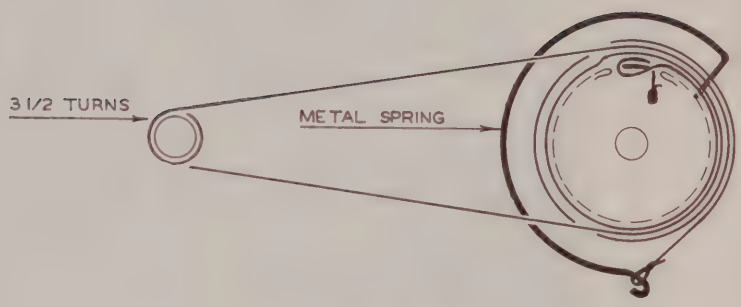
ITEM No.	PART NAME	General Electric PART No.	NOTES
M4	Tuner	RJX-062	VHF
	Tuner	RJX-059	VHF
	Tuner	RUX-001	UHF
	Tuner	RUX-002	UHF
	Tuner	RUX-003	UHF
	Tuner	RUX-006	UHF
	Tuner	RUX-007	UHF
M5	Focus Magnet	RLF-066	Includes centering device
M6	Ion Trap	RET-013	
	Cabinet	RAV-240	Model 21T26
	Cabinet	RAV-241	Model 21T27
	Cabinet	RAV-244	Model 21C240
	Cabinet	RAV-245	Model 21C241
	Cabinet	RAV-250	Model 21C242
	Cabinet	RAV-251	Model 21C243
	Cabinet	RAV-252	Model 21C244
	Cabinet	RAV-253	Model 21C245
	Knob	RDK-340	Local-Distant
	Knob	RDK-403	Contrast - brown
	Knob	RDK-414	Contrast - Fawn
	Knob	RDK-405	Brightness & UHF fine tuning - brown
	Knob	RDK-416	Brigheness & UHF fine tuning - fawn
	Knob	RDK-423	On-off-volume - brown
	Knob	RDK-424	On-off-volume - fawn
	Knob	RDK-426	Vertical & fine tuning - brown
	Knob	RDK-427	Vertical & fine tuning - fawn
	Knob	RDK-430	UHF indicator - brown (RUX-006, RUX-007)
	Knob	RDK-432	UHF indicator - fawn (RUX-006, RUX-007)
	Knob	RDK-429	UHF indicator - brown (RUX-003)
	Knob	RDK-431	UHF indicator - fawn (RUX-003)
	Knob	RDK-434	VHF selector switch - brown
	Knob	RDK-436	VHF selector switch with UHF - brown
	Knob	RDK-438	VHF selector switch - fawn
	Knob	RDK-440	VHF selector switch with UHF - fawn
	Knob	RDK-420	UHF selector switch - brown (RUX-003)
	Knob	RDK-422	UHF selector switch - fawn (RUX-003)
	Knob	RDK-433	VHF-UHF selector - brown (RUX-003)
	Knob	RDK-448	VHF-UHF selector - fawn (RUX-003)
	Safety glass	RDW-067	
	Mask	RDM-049	Models 21T26, 21T27, 21C240
	Mask	RDM-050	Model 21C241

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



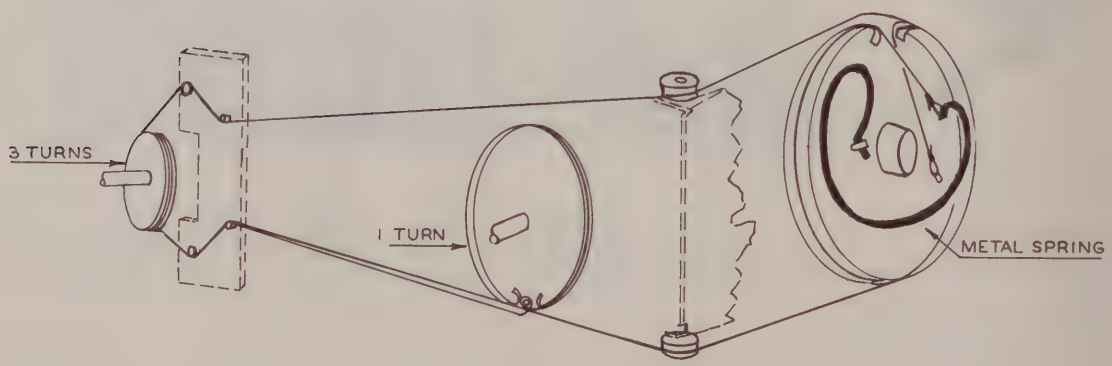
CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

EARLY PRODUCTION



LATE PRODUCTION

VHF FINE TUNING DRIVE CORD STRINGING



UHF DRIVE CORD STRINGING

TROUBLE SHOOTING AIDS (cont)

PROPERTY OF
L. F. LUMLEY MSHIP
3924 MEADE ST.
DENVER, COLORADO

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V14, V15, V16 and V17. Check M2 fuse. Check waveform W14.

If Satisfactory	If Unsatisfactory
Check T2, T4A, T5, T6, C96, C93, C94, C95, C91, R106, R105 and other associated components.	Check C90, C88, C87, R101, R99, L38 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V15, V16, V18 and V19. Check R106, R105, R102, C89, C90 and other associated components. Check B2 and B3.

BLOOMING

Check by substitution V15, V16, V17, V18 and V19. Check R110, R109, C2D, C90 and other associated components.

GENERAL

RASTER, SOUND, NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER, PICTURE, NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER, NO SOUND, NO PICTURE

Check by substitution V1, V2, V3, V4, V5 and V6. Check video IF alignment for component failure or change of value.

NO RASTER, NO SOUND

Follow procedure outlined under "Dead Set".

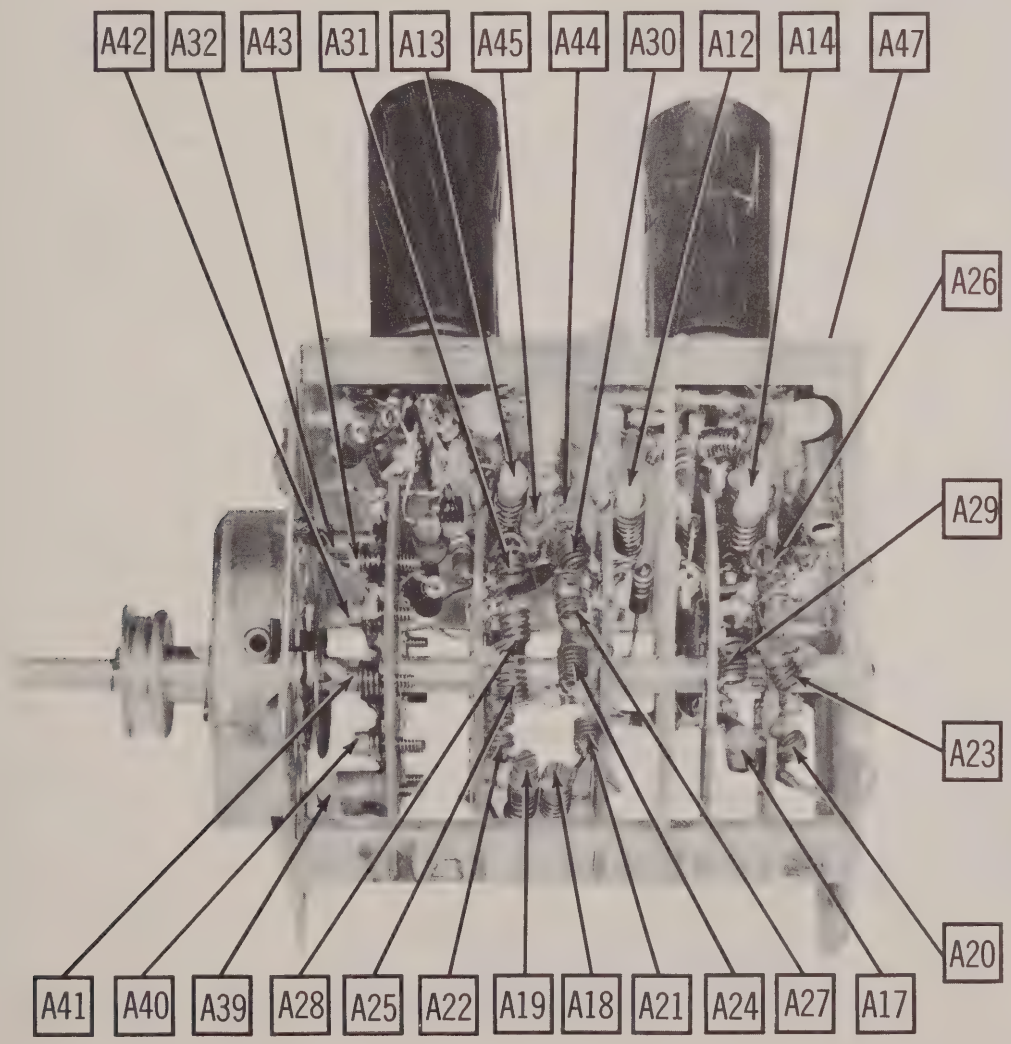
KEYSTONE EFFECT

Check T4 and its associated components.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.



RF TUNER RIGHT SIDE ALIGN. IDENTIFICATION

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF Tuner Oscillator Circuit may be accomplished by removing the Channel Selector and Fine Tuning knobs.

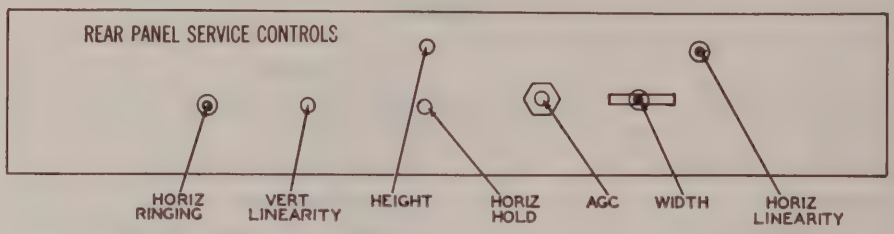
PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety glass cleaning, it is necessary to remove chassis. (See disassembly instructions.)

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions.)

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the Horiz. Oscillator Circuit can be made from the rear panel of the chassis. Set the Horiz. Hold Control at the mid-position of its range and adjust the Horiz. Ringing Coil slug L38 until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF Detector Buzz, adjust the Ratio Detector Secondary L37 located on top of chassis. (See tube placement chart.)

FUSES

Two fuses are used. One for Horiz. Sweep Circuit protection and one for L. V. Power Supply protection. (For location, see tube placement chart.)

CENTERING

Centering is accomplished mechanically by means of a centering lever on the P. M. Focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

1. Remove 6 push-on type control knobs from front panel.
2. Remove 1 push-on type control knob from rear panel.
3. Remove 8 metal screws and 1 nut from rear cover. Remove rear cover.
4. Loosen 2 antenna bracket mounting screws, remove antenna bracket.
5. Disconnect picture tube socket, deflection yoke socket and H. V. lead.
6. Disconnect speaker leads. Remove 4 speaker nuts. Remove speaker.
7. Remove 4 chassis bolts. Remove chassis.

TO REMOVE PICTURE TUBE:

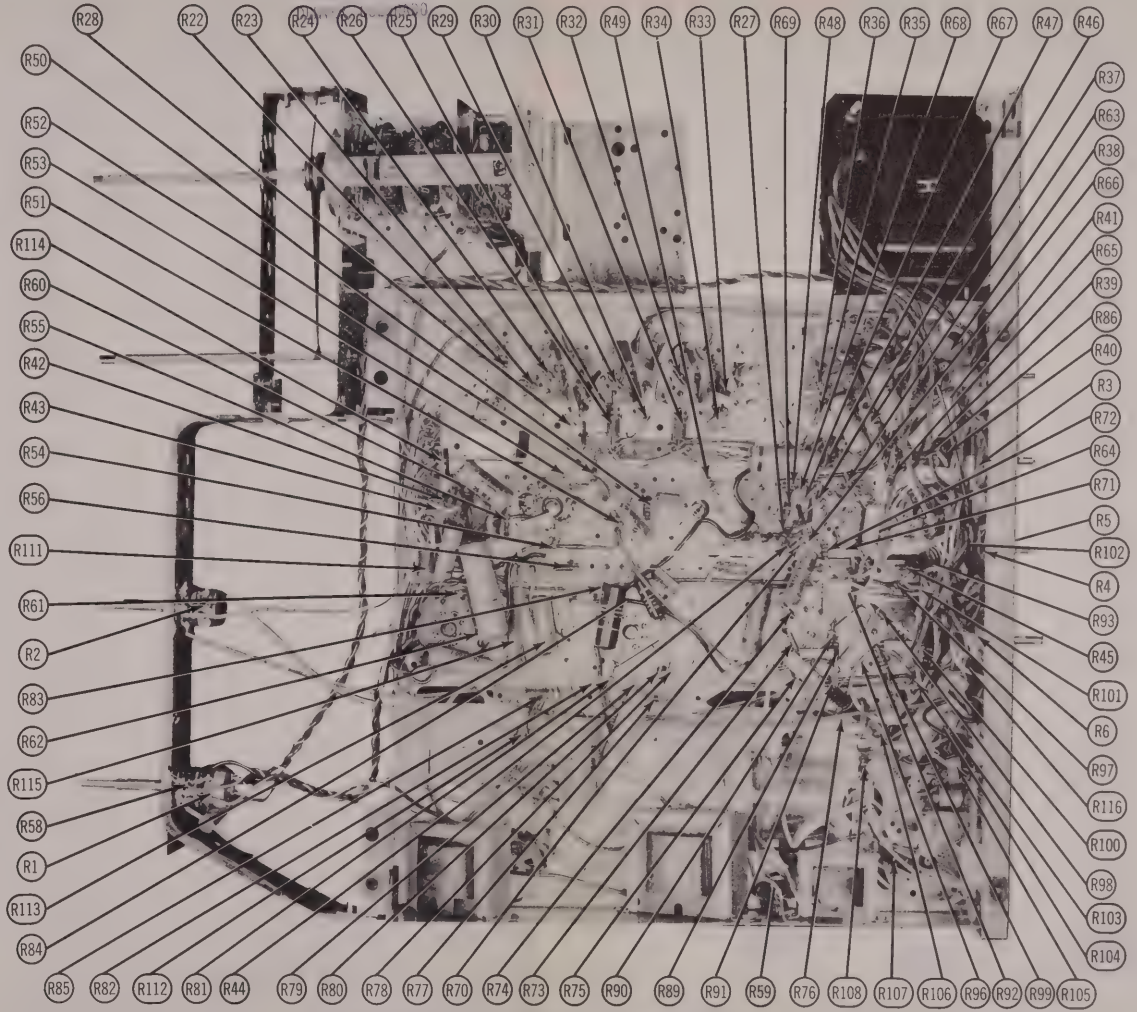
Remove chassis.

Remove 4 nuts from picture tube mounting rods (4).

Remove 1 nut from front tube mounting band.

Remove picture tube and yoke assembly.

Remove picture tube from yoke assembly.



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

MARTIN
MODEL 352A

MARTIN
MODEL 352A

TRADE NAME	Martin Model 352A
MANUFACTURER	H. S. Martin & Co., 1916-20 Greenleaf St., Evanston, Ill.
TYPE SET	AC Operated Audio Amplifier
TUBES (Eight)	Types 12AY7 AF Amp. -Phase Inv., (2) 6J5 Driver, (2) KT66 Output, 5U4G Rectifier, 6X5GT Rectifier, OD3GT Regulator
POWER SUPPLY	110-120 Volts AC RATING . 34 Amp. @ 117 Volts AC

THE FOLLOWING PHOTOFACT FOLDER IN THIS SET COVERS MARTIN PRE-AMPLIFIER MODEL 352CA WHICH MAY BE USED IN CONJUNCTION WITH THIS EQUIPMENT.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

MARTIN MODEL 352A

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: MARTIN PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	AF Amp-Phase Inverter	12AY7	12AY7	9A	
V2	Driver	6J5	6J5	6Q	
V3	Driver	6J5	6J5	6Q	
V4	Output	KT66	KT66	7S	
V5	Output	KT66	KT66	7S	
V6	Rectifier	5U4G	5U4G	5T	
V7	Rectifier	6X5GT	6X5GT	6S	
V8	Regulator	0D3GT	0D3GT	4AJ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MARTIN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	500		AFH2-72		B053		FP288	TVL-2830	
B	■40	500								
C2A	▲40	500		AFH2-72		B053		FP288	TVL-2830	
B	■40	500								
C3A	▲80	450		AFH3-46		D121		FP378	TVL-4774	
B	■20	450								
C	▲20	450								
C4A	■1000	15		AFH2-02		B004		WP200	TVA-1163	Note 1
B	■1000	15								
C5	500	5		PRS6/500		BRH605		TC605	TVA-1103	
C6	100	100		PRS150/100		BR10015		TC495	TVA-1420	
C7	.1	400		P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C8	50			SI50	D6-500	TP30	GP1K-500	UC-545	5GA-Q5	
C9	.1	600		P688-1	DF-104	CUB6P1		PT601	6TM-P1	
C10	.1	600		P688-1	DF-104	CUB6P1		PT601	6TM-P1	
C11	.1	600		P688-1	DF-104	CUB6P1		PT601	6TM-P1	
C12	.1	600		P688-1	DF-104	CUB6P1		PT601	6TM-P1	
C13	100			SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C14	.047	600		P688-047	DF-503	CUB6S47		PT6147	6TM-S47	
C15	.047	600		P688-047	DF-503	CUB6S47		PT6147	6TM-S47	

Note. Some models may use a dual 150MFD@ 15V in this application.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MARTIN PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	62-102	Q13-137	A47-500K-Z	AB51	U48	Volume
B	Shaft		Not Req.	Not Req.	RS-2	AK-9	Not Req.	Attach to R1A
R2A	100Ω	2	64-101	W100	A43-100	VK121	R100L	Bias Wire Wound
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R2A
R3A	100Ω	2	64-101	W100	A43-100	VK121	R100L	Balance Wire Wound
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R3A

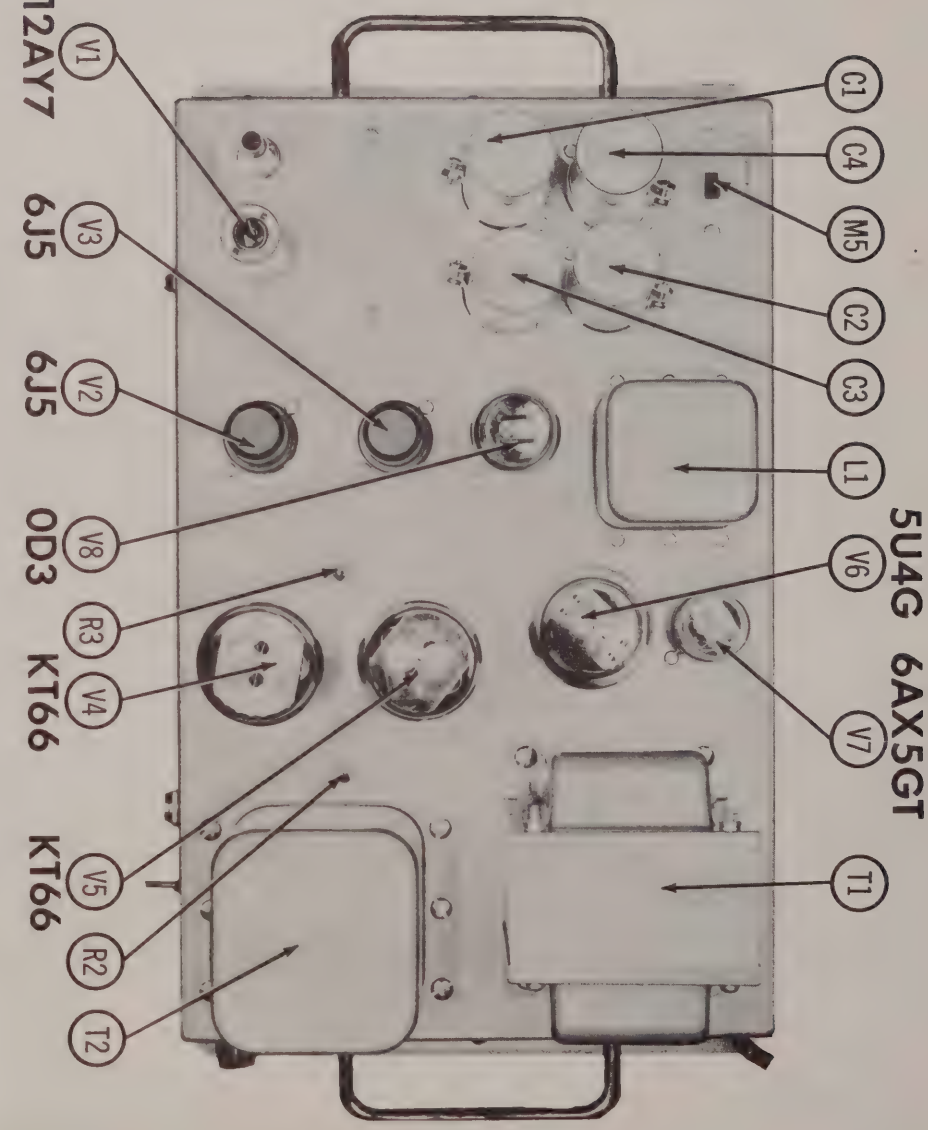
RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: MARTIN PART No.	IRC PART No.	NOTES
R4	820Ω	1		BTA-820	
R5	390Ω 5%	1		BTA-390 5%	
R6	50KΩ	10		2D -50K	
R7	27KΩ	2		BTB-27K	
R8	27KΩ	2		BTB-27K	
R9	100KΩ	2		BTB-100K	
R10	470KΩ	1		BTA-470K	
R11	820Ω	1		BTA-820	
R12	50KΩ	10		2D-50K	
R13	470KΩ	1		BTA-470K	
R14	50KΩ	10		2D-50K	
R15	120KΩ 5%	1		BTA-120K 5%	
R16	200Ω	10		1 3/4A-200	
R17	120KΩ 5%	1		BTA-120K 5%	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA*: MARTIN PART No.	IRC PART No.	NOTES
R18	100Ω	2		BTB-100	
R19	100Ω	2		BTB-100	
R20	10KΩ	1		BTA-10K	
R21	5KΩ	10		1 3/4A-5000	
R22	4700Ω	2		BTB-4700	
R23	100KΩ	2		BTB-100K	
R24	25Ω	10		1 3/4A-25	
R25	39Ω	2		BTB-39	
R26	25Ω	10		1 3/4A-25	
R27	10KΩ	½		BTS-10K	Note 1
R28	1.5Ω	½			Note 1

Note 1: Not used in all models.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	MARTIN PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC @ .34A	860VCT .134ADC Tap@ 470VCT .028ADC	5VAC @3A	6.3VAC @4A SEC. 4 14VAC .140ADC	2-101					

① Drill one new mounting hole.
② Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MARTIN PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T2	14KΩ CT	16Ω Tap@ 8Ω	3-103			S-148A	H4103 ①		① Drill new mounting holes.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	MARTIN PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
L1	.134A	169Ω	17.5HY					C5025 ②	26C45 ②
L2	.028A	290Ω	10HY	1-103	C-1355 ①		C-8X	C5013	20C59 ①
L3	.028A	290Ω	10HY	1-103	C-1355 ①		C-8X	C5013	20C59 ①
L4	.140A	3.82Ω	.1HY	1-104					

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	MARTIN PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	SELETRON PART No.	
M1	.140A		1013	B1H		701		

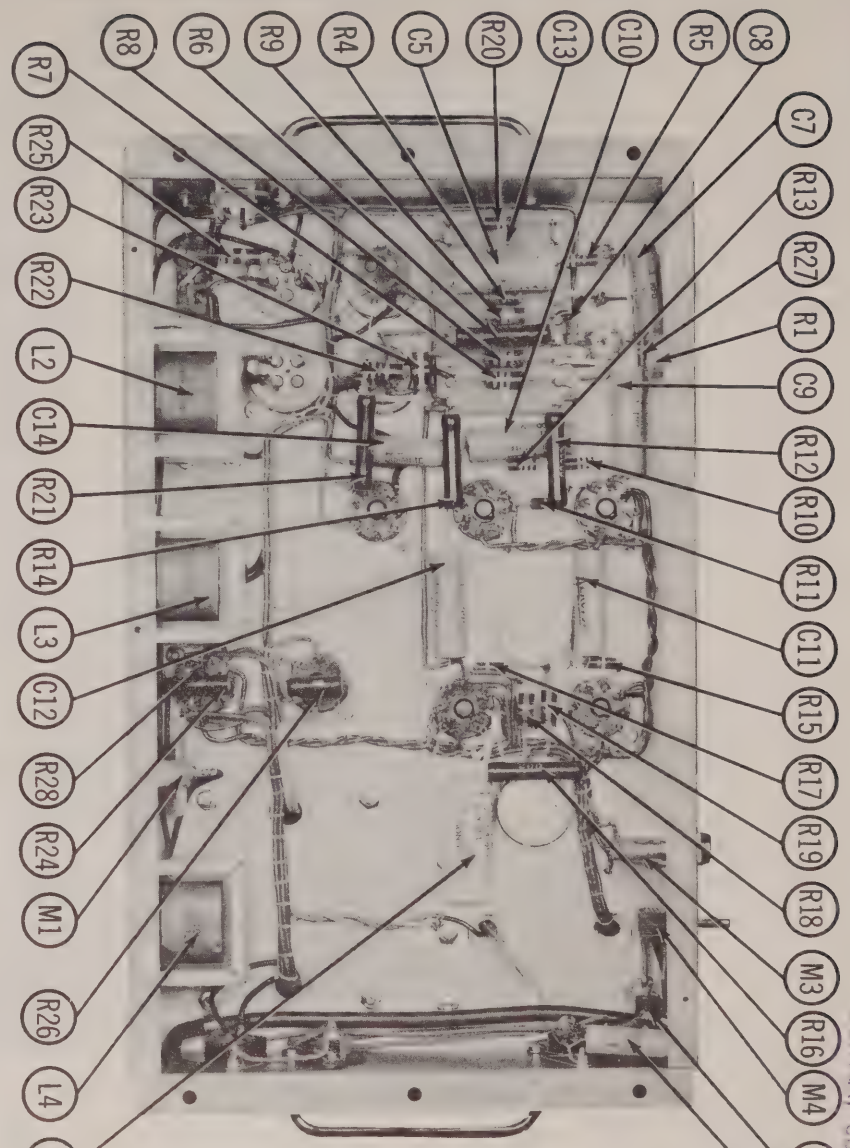
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MARTIN PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG S/B	3A 125B			313003 (3A-3AG-S/B)	342001	MDL3	HKP

MISCELLANEOUS

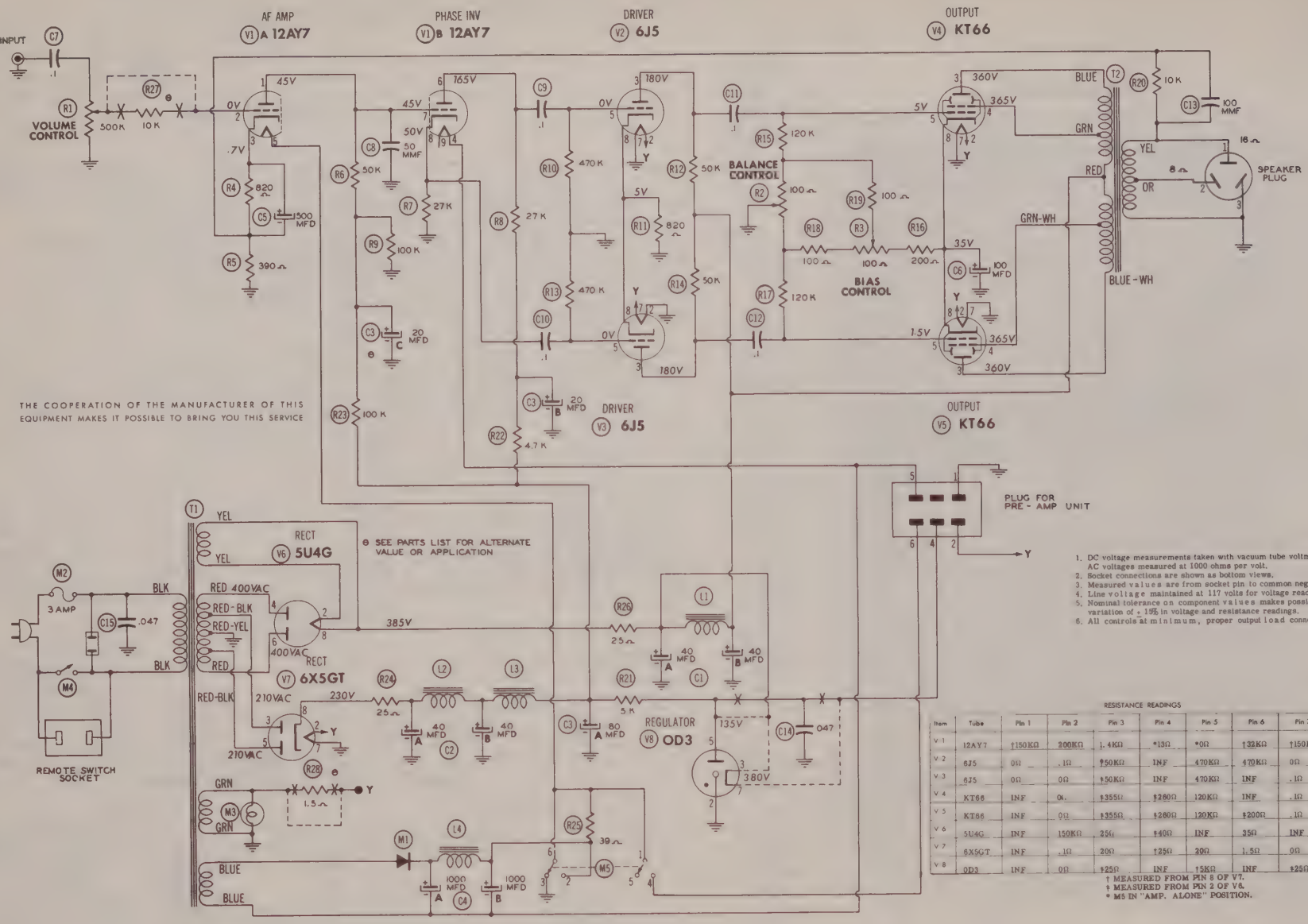
ITEM No.	PART NAME	MARTIN PART No.	NOTES
M3	Dial Light		#44, Bayonet
M4	Switch		On-Off
M5	Switch		Connect Amp. - Amp. Alone

CHASSIS—BOTTOM VIEW



PROPERTY OF
L. F. [illegible]
[illegible] ANE ST.
DENVER, COLORADO
MARTIN MODEL 352

MARTIN MODEL 352



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AY7	†150KΩ	200KΩ	1.4KΩ	*13Ω	*0Ω	†32KΩ	†150KΩ	27KΩ	*13Ω
V 2	6J5	0Ω	.1Ω	†50KΩ	INF	470KΩ	470KΩ	0Ω	820Ω	
V 3	6J5	0Ω	0Ω	†50KΩ	INF	470KΩ	INF	.1Ω	820Ω	
V 4	KT66	INF	0Ω	†355Ω	†260Ω	120KΩ	INF	.1Ω	350Ω	
V 5	KT66	INF	0Ω	†355Ω	†260Ω	120KΩ	†200Ω	.1Ω	350Ω	
V 6	5U4G	INF	150KΩ	25Ω	†40Ω	INF	35Ω	INF	150KΩ	
V 7	6X5GT	INF	.1Ω	20Ω	†25Ω	20Ω	1.5Ω	0Ω	100KΩ	
V 8	OD3	INF	0Ω	†25Ω	INF	†5KΩ	INF	†25Ω	INF	

† MEASURED FROM PIN 8 OF V7.
† MEASURED FROM PIN 2 OF V6.
* M5 IN "AMP. ALONE" POSITION.

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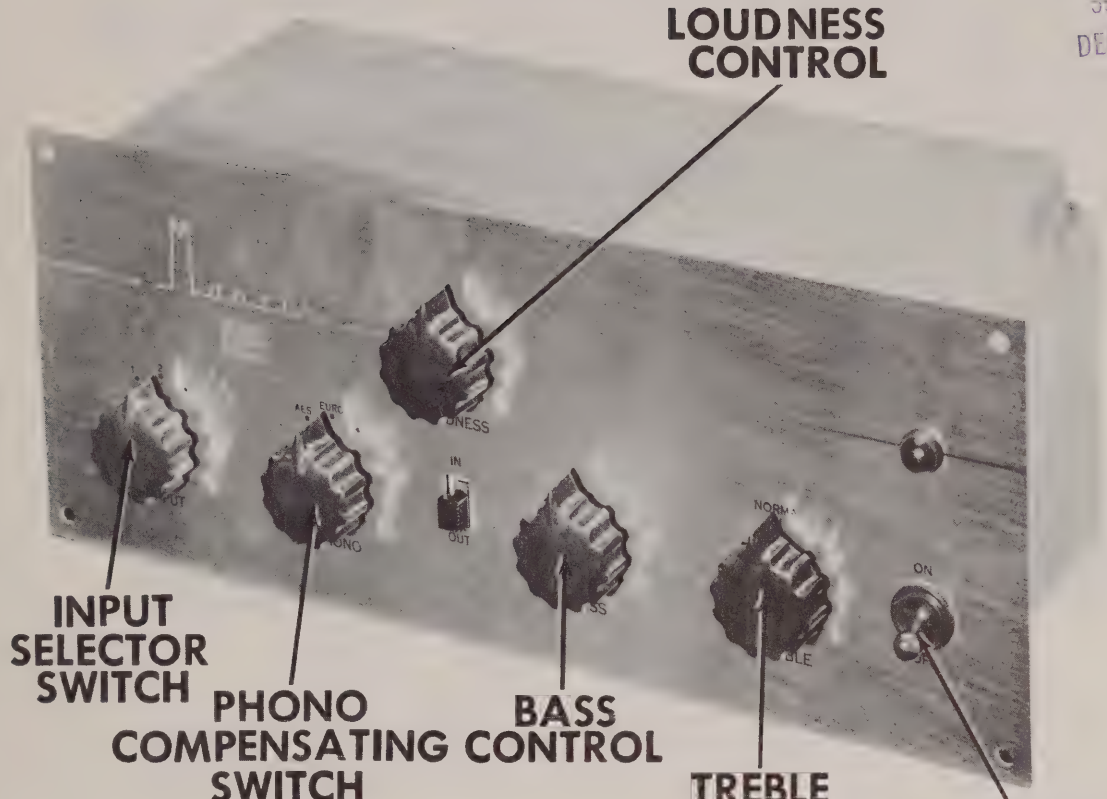
DENVER, COLORADO

MARTIN
MODEL 352CA



MARTIN
MODEL 352CA

TRADE NAME	Martin Model 352CA
MANUFACTURER	H. S. Martin & Co., 1916-20 Greenleaf St., Evanston, Ill.
TYPE SET	Three Channel Control & Pre-Amplifier
TUBES (Three)	Types 12AY7 Phono Pre-Amp., 12AY7 AF Amp., 12AU7 Cath. Follower
POWER REQUIREMENTS	450MA @ 12 Volts DC & 25MA @ 150 Volts DC

THIS UNIT IS DESIGNED TO OPERATE IN CONJUNCTION WITH MARTIN POWER AMPLIFIER MODEL 352A WHICH IS COVERED IN THE PRECEDING PHOTOFACT FOLDER OF THIS SET.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

MARTIN MODEL 352CA

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		MARTIN PART No.	STANDARD REPLACEMENT		
V1	Phono Pre-Amp.	12AY7	12AY7	9A	
V2	AF Amp.	12AY7	12AY7	9A	
V3	Cath. Follower	12AU7	12AU7	9A	

CAPACITORS

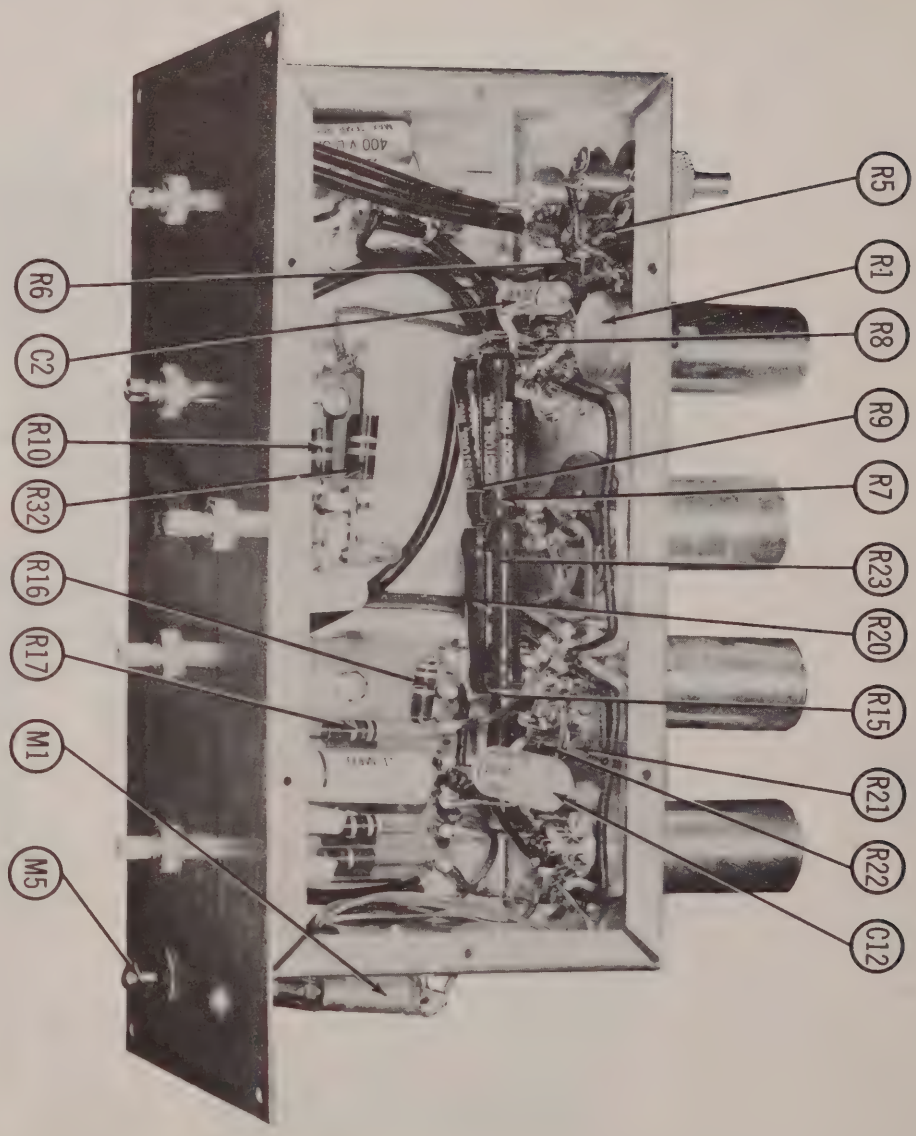
Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MARTIN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■20	250		AFH2-26		B021		FP217	TVL-2520	
B	▲20	250								
C2	.01	400		P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C3	500	500		1469-0005		5R5T5		MCE245	MS-35	
C4	1000	500		1464-001		1R5D1		MCE255	MS-21	
C5	5000	500		1464-005		1R5D5		MCE465	MS-25	
C6	.01	400		P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C7	7000	500		1464X-007		1R5D7		MCE469	MS-27	
C8	.01	400		P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C9	.1	400		P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C10	.015	400		P488-015		CUB4S15		PT4115	4TM-S15	
C11	.015	400		P488-015		CUB4S15		PT4115	4TM-S15	
C12	.1	400		P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C13	.1	400		P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C14	5000	500		1464-005		1R5D5		MCE465	MS-25	
C15	2000	500		1464-002		1R5D2		MCE457	MS-22	
C16	82			SI82	D6-820	TZ28	GP1K-820	UC-5482	5GA-Q82	
C17	.03	400		P488-03		CUB4S3		PT413	4TM-S3	
C18	500	500		1469-0005		5R5T5		MCE245	MS-35	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MARTIN PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	100KΩ	½	62-106	Q11-128	A47-100K-S	AB-40	U-41	Input Level
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R1A
R2A	250KΩ	½	62-114	Q11-130	A47-250K-S	AB-50	U-46	Treble
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R2A
R3A	2Meg	½	62-105	Q13-139	A47-2Meg-S	AB-76	U-55	Bass
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R3A
R4A	500KΩ	½	63-103	Q11-133				
B	1Meg	½		M13-137				Loudness
C	100KΩ	½		M13-128				

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

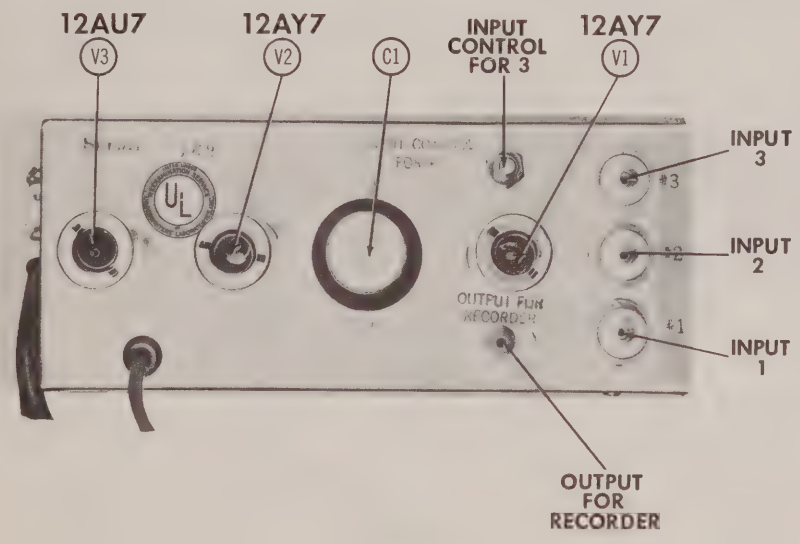
ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA MARTIN PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R5	2200Ω	1		BTA-2200	Note 1
R6	1800Ω	1		BTA-1800	
R7	50KΩ	10		2D-50K	
R8	10Meg	½		BTS-10Meg	
R9	50KΩ	10		2D-50K	
R10	10KΩ	2		BTB-10K	
R11	47KΩ	1		BTA-47K	
R12	10Meg	½		BTS-10Meg	
R13	10Meg	½		BTS-10Meg	
R14	10Meg	½		BTS-10Meg	
R15	1Meg	1		BTA-1Meg	
R16	3300Ω	1		BTA-3300	
R17	3300Ω	1		BTA-3300	
R18	27KΩ	1		BTA-27K	
R19	180KΩ	1		BTA-180K	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA MARTIN PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R20	50KΩ	10		2D-50K	
R21	1Meg	1		BTA-1Meg	
R22	820Ω	1		BTA-820	
R23	50KΩ	10		2D-50K	
R24	27KΩ	1		BTA-27K	
R25	100KΩ	1		BTA-100K	
R26	100KΩ	1		BTA-100K	
R27	100KΩ	1		BTA-100K	
R28	10KΩ	1		BTA-10K	
R29	3300Ω	1		BTA-3300	
R30	100KΩ	1		BTA-100K	
R31	1Meg	1		BTA-1Meg	
R32	10KΩ	2		BTB-10K	

Note 1: Not used in all models.

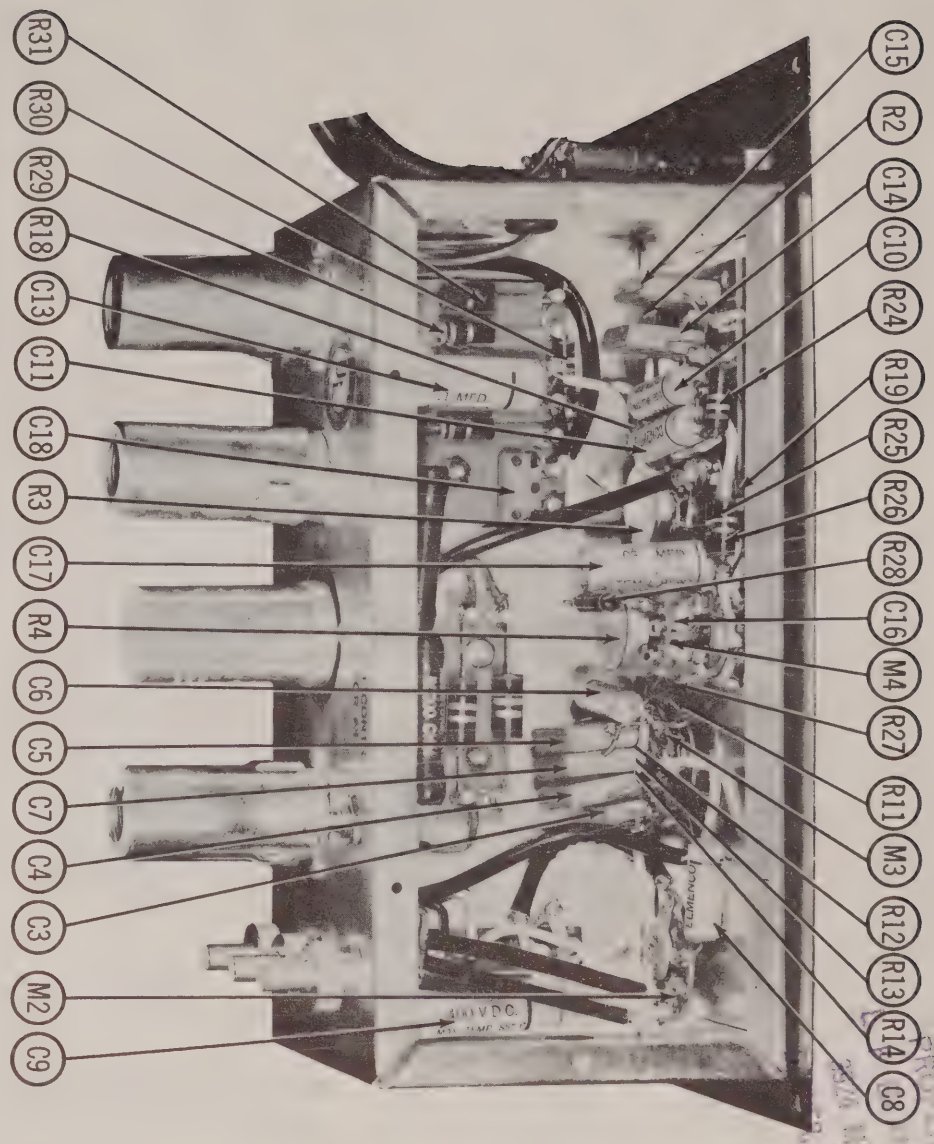
MISCELLANEOUS

ITEM No.	PART NAME	MARTIN PART No.	NOTES
M1	Dial Light		Type #44
M2	Switch		Input Selector
M3	Switch		Phono-Compensation-Selector
M4	Switch		Loudness In-Out
M5	Switch		On-Off



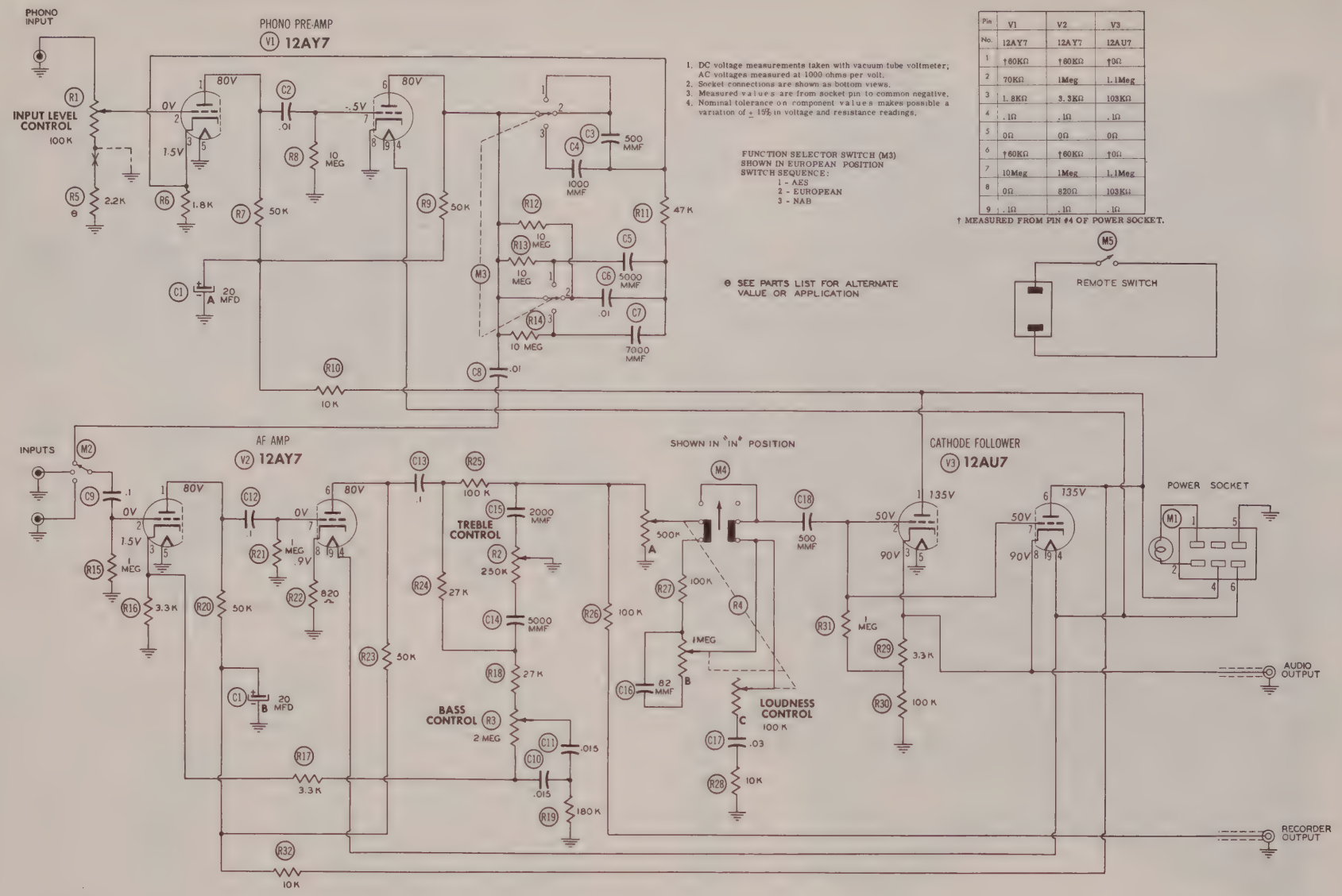
CHASSIS—REAR VIEW

CHASSIS — TOP VIEW



MARTIN MODEL 352CA

PROPERTY OF
MARTIN-MUSIC
2520 HIGHLAND
COLORADO



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RETMA MEMBER
RADIO-ELECTRONICS-TELEVISION MANUFACTURERS ASSOCIATION

PROPERTY OF
L. F. BLANKENSHIP
3974 MEADE ST.
DENVER, COLORADO

MASCO
MODELS MF-5, MF-10

MASCO
MODELS MF-5, MF-10

TRADE NAME	Masco Model MF-5, MF-10
MANUFACTURER	Mark Simpson Mfg. Co., Inc., 32-28 49th St., Long Island City 3, N. Y.
TYPE SET	AC-DC Operated Inter-communication System Master Unit
TUBES (Three)	Types 12AX7 AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC RATING .15 Amp. @ 117 Volts AC

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PARTS LIST AND DESCRIPTIONS

MASCO MODEL MF-5

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: MASCO PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	AF Amp.	12AX7	12AX7	9A	
V2	Output	50C5	50C5	7CV	
V3	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MASCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	40	150		PRS150/50-30 -20		BBRT44215		3N532	TVA-3448	Red
B	40	150								Red
C	20	150								Green
C2	10	50		PRS50/10		BR105		TC32	TVA-1304	
C3	0047	600		P688-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C4	0047	600		P688-0047	C6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C5	470			SI470	D6-471	TP46	GP2K-471	UC-5347	5GA-T47	
C6	.03	600		P688-03		CUB683		PT613	6TM-S3	
C7	.1	600		689ZX-1	DF-104	CUB6P1		PT601	6TM-P1	

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MASCO PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½		Q13-133	A47-500K-Z	B-60-S	U-48	Volume
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	Attach to R1A
C	Switch			76-1	SWE-12	Not Req.	US-26	Attach to R1A
R2	50Ω	1						Balance adjustment (Wire-Wound)

RESISTORS

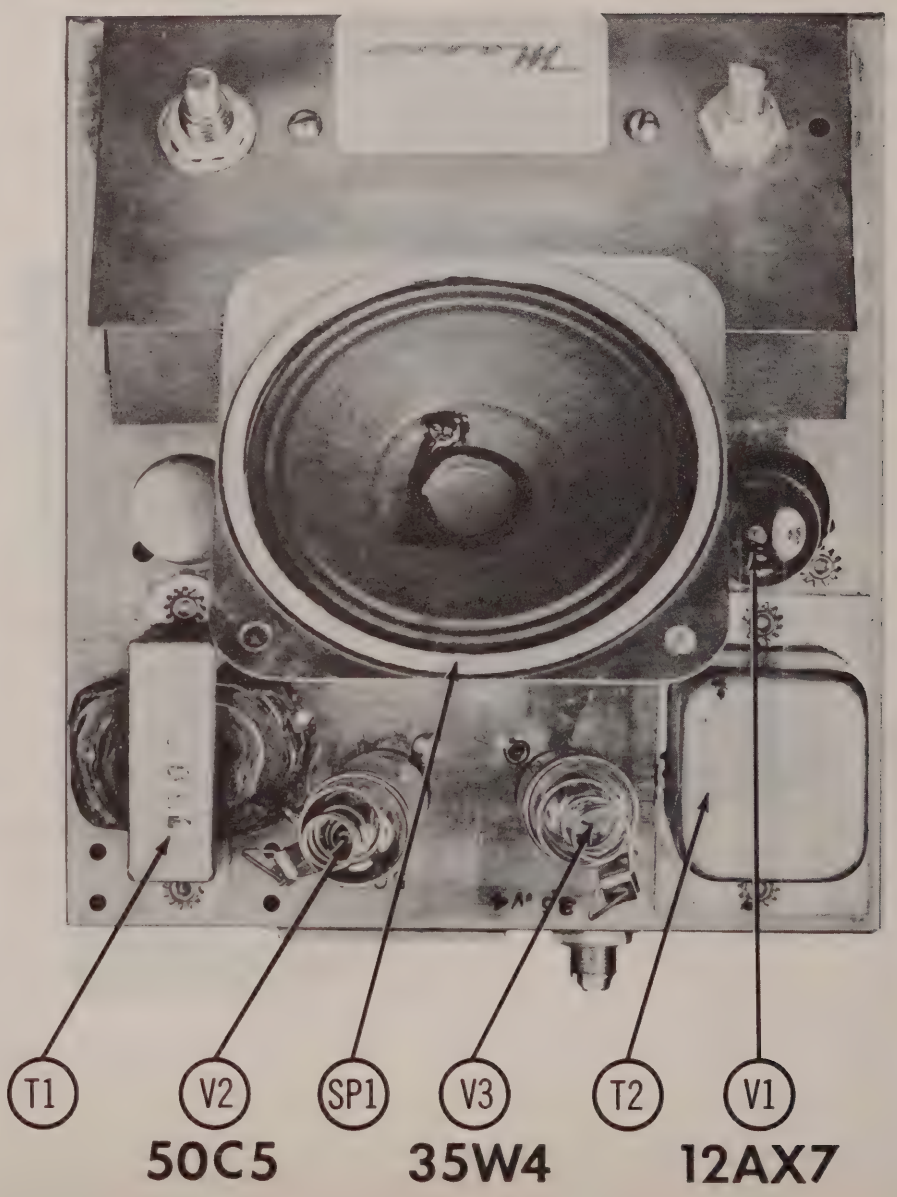
ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: MASCO PART No.	IRC PART No.	NOTES
R3	1500Ω	½		BTS-1500	
R4	270KΩ	½		BTS-270K	
R5	1Meg	½		BTS-1Meg	
R6	10Meg	½		BTS-10Meg	
R7	270KΩ	½		BTS-270K	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: MASCO PART No.	IRC PART No.	NOTES
R8	150Ω	½		BTS-150	
R9	4700Ω	½		BTS-4700	
R10	270Ω	2			
R11	280Ω	8			

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: MASCO PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T1	800Ω	13Ω	13-0-2C						

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (INPUT)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	MASCO PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T2	.5Ω DC	705Ω Turns ratio 1 to 180			1554					

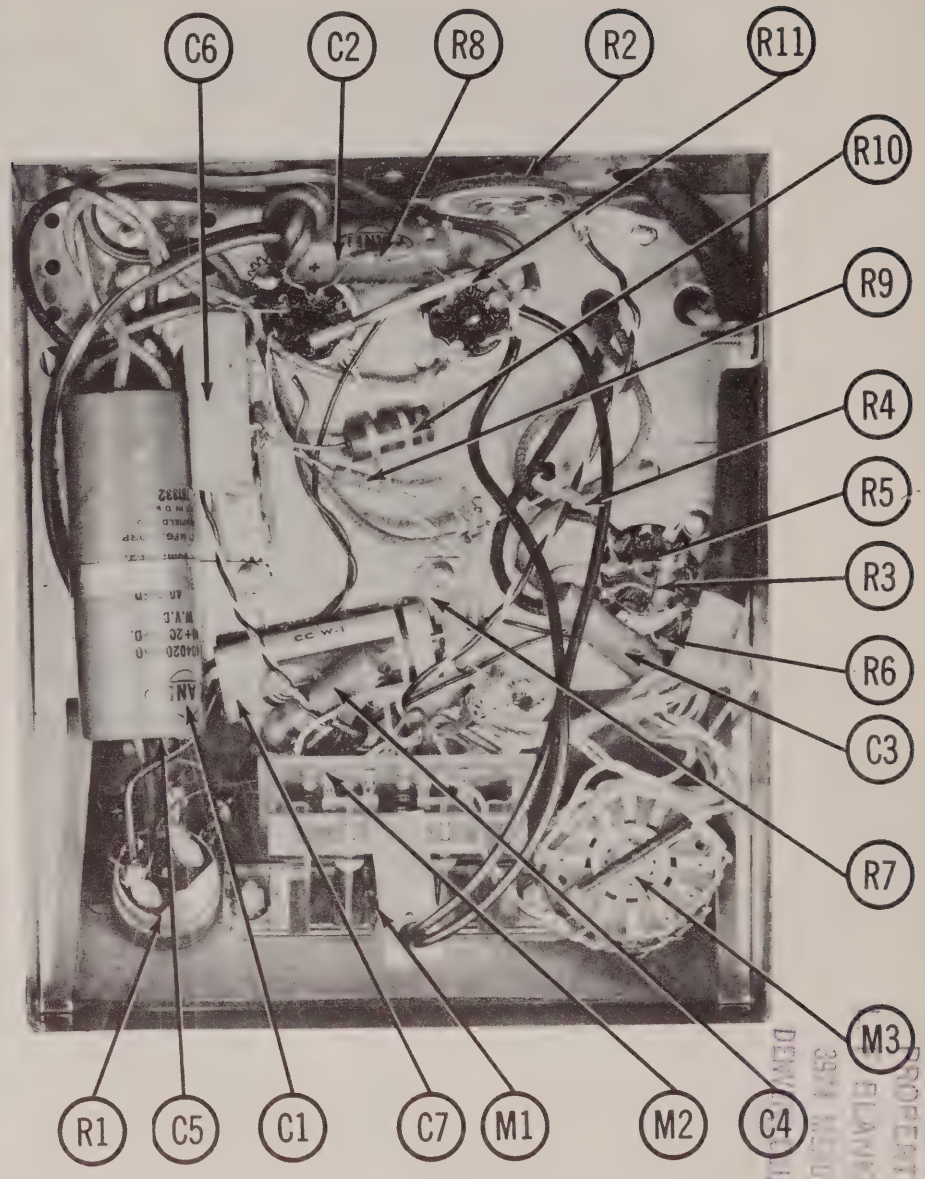
SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	MASCO PART No.	JENSEN PART No.	QUAM PART No.	
SP1	3½"	PM	13Ω			3A07Z13	

MISCELLANEOUS

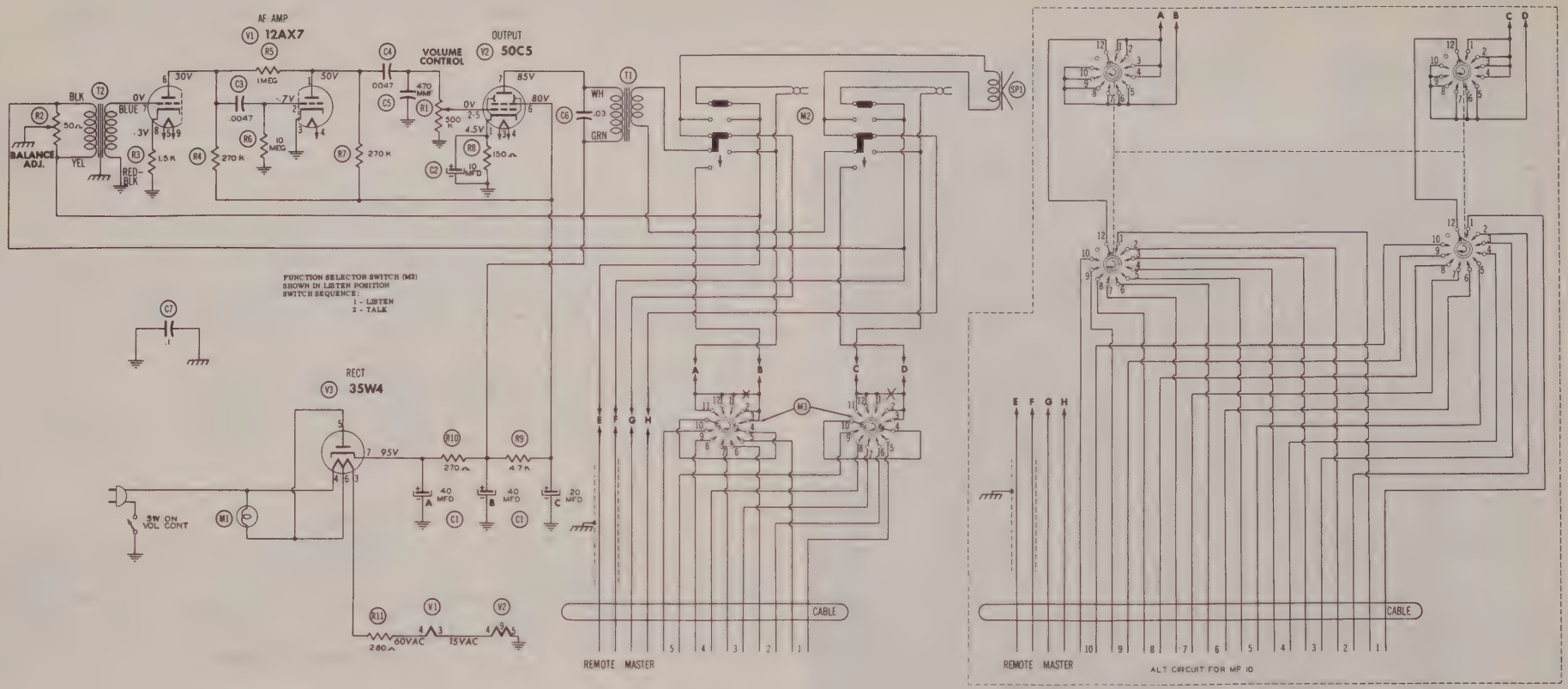
ITEM No.	PART NAME	MASCO PART No.	NOTES
M1	Dial light		Bayonet, #47
M2	Switch		Talk-Listen
M3	Switch		Station Selector

CHASSIS—BOTTOM VIEW



PROPERTY OF
ELAMPENSHIP
3874 MEADE ST.
DENVER, COLORADO

MASCO
MODEL MF-5



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1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

COLOR CODE

REMOTE MASTER	BLACK-WHITE SHIELDED
1	BLUE-WHITE
2	BROWN-WHITE
3	RED - WHITE
4	ORANGE - WHITE
5	YELLOW - WHITE
6	GREEN - WHITE

FUNCTION SELECTOR SWITCH (M3) SHOWN IN STANDBY POSITION

COLOR CODE

REMOTE MASTER	BLACK-WHITE SHIELDED
1	BLUE -WHITE
2	BROWN - WHITE
3	RED - WHITE
4	ORANGE - WHITE
5	YELLOW - WHITE
6	GREEN - WHITE
7	WHITE -BLUE - BLACK STRIPE
8	WHITE -RED-BLACK STRIPE
9	WHITE - GRAY
10	WHITE - WHITE - BLACK STRIPE
	WHITE - YELLOW -BLACK STRIPE

Pin No.	V1 12AX7	V2 50C5	V3 35W4
1	1270KΩ	150Ω	0Ω
2	10Meg	120KΩ	0Ω
3	0Ω	14Ω	350Ω
4	14Ω	90Ω	400Ω
5	0Ω	130KΩ	390Ω
6	1270KΩ	15KΩ	390Ω
7	800Ω	1450Ω	40KΩ
8	1.5KΩ		
9	Ω		

† MEASURED FROM PIN 7 OF V3.

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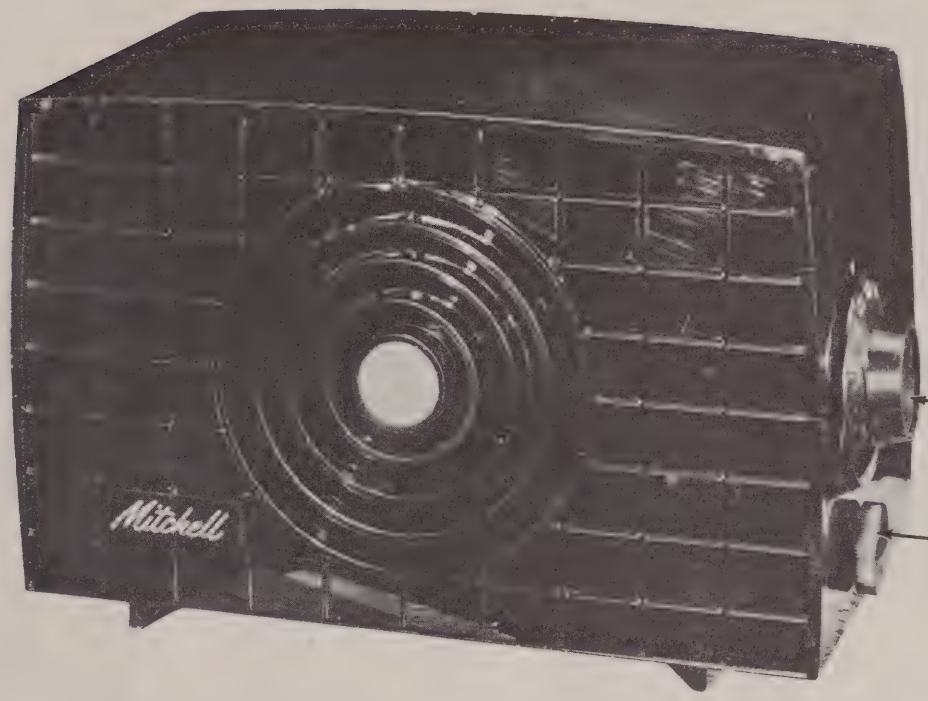
DENVER, COLORADO

MITCHELL MODELS
1258, 1259, 1266, 1281



MITCHELL MODELS
1258, 1259, 1266, 1281

TRADE NAME	Mitchell Models 1258, 1259, 1266, 1281
MANUFACTURER	Mitchell Mfg. Co., 2525 Clybourn Ave., Chicago 14, Ill.
TYPE SET	AC-DC Operated AM Superheterodyne Receiver
TUBES (Four)	Types 12AU6 Conv., 12AV6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC — RATING .23 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial. Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to antenna stator lug on tuning gang. Low side to B-	455KC (400%Mod)	Tuning gang fully open	Across voice coil	A1, A2	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1620KC	"	"	A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A4	"
4.		"	600KC	Tune to 600KC signal	"		If necessary bend slotted antenna rotor plates for maximum output. Repeat step 3.

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PARTS LIST AND DESCRIPTIONS

MITCHELL MODEL 1258

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		MITCHELL PART No.	STANDARD REPLACEMENT		
V1	Converter	12AU6	12AU6	7BK	
V2	Det.-AF Amp.	12AV6	12AV6	7BT	
V3	Output	50C5	50C5	7CV	
V4	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MITCHELL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	50	150	N-8677	PRS86D4A		BBRT5315C		TCT3107	TVA-3430	Blue
B	20	150								Red
C	20	15								Brown
C2	50		N-6385	SI50	D6-500	TP30	GP1K-500	UC-5445	5GA-Q5	
C3	100		N-6015	SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C4	.003	600	N-2063	P688-003	D6-302	CUB6D3	GP2-333-302	PT623	6TM-D3	
C5A	5000									
B	250		♦N-8215	♦PA-112-2	♦PC-71	♦112TM2	♦1406-02		♦T-4	
C										
C6	.01	400	N-1344	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C7	.05	400	N-1346	489ZX-05	DF-503	PJ4S5		PT415	4TM-S5	
C8	.05	200	N-1345	P288-05	DF-503	PJ2S5		PT415	4TM-S5	

♦ Items C5A, C5B, C5C, R4A, R4B are combined in one unit.
When replacing items separately, items C5B and C5C should total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MITCHELL PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	2Meg	½	N-7142	Q13-139	A47-2Meg-Z	AB-76	U-55	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-12	KB-1	US-26	

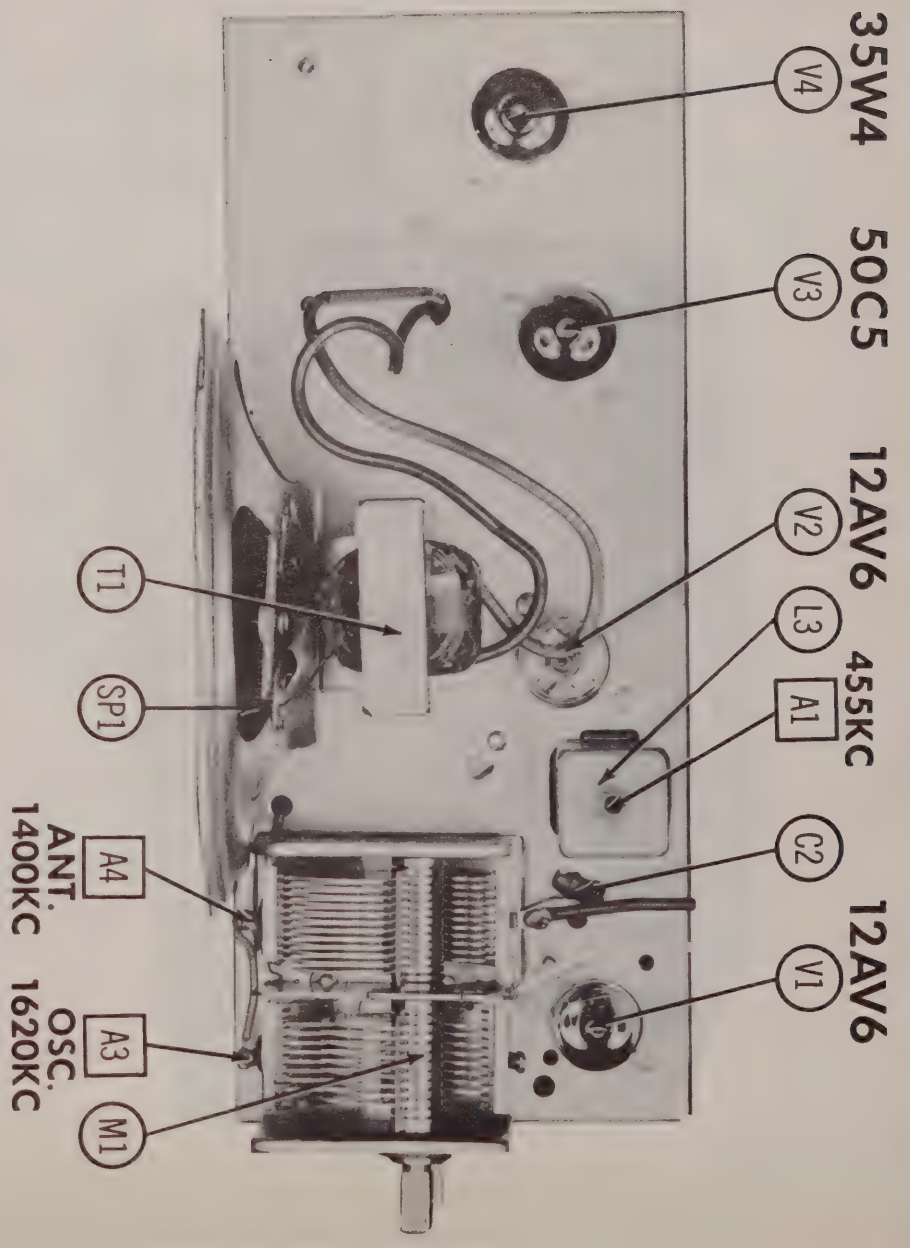
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MITCHELL PART No.	IRC PART No.	
R2	2.2Meg	½	N-4277	BTS-2.2Meg	
R3	6.8Meg	½	N-4028	BTS-6.8Meg	
R4A	220KΩ	½	♦N-8215	BTS-220K	
B	470KΩ	½		BTS-470K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MITCHELL PART No.	IRC PART No.	
R5	180Ω	½	N-4067	BTS-180	
R6	2200Ω	½	N-4896	BTS-2200	
R7	82Ω	2	N-4023		

♦ Items R4A, R4B, C5A, C5B, C5C are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MITCHELL PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	2.6KΩ	3.7Ω	Part of Spkr.	A-3332 ①	A-3025 ①	S-12X ①	Z1101 ①		① Bend mounting tabs down, file out slots, mount on original mounting bracket.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	MITCHELL PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.7Ω	N-7824	ST-113 Mod. P4-X	4A1	

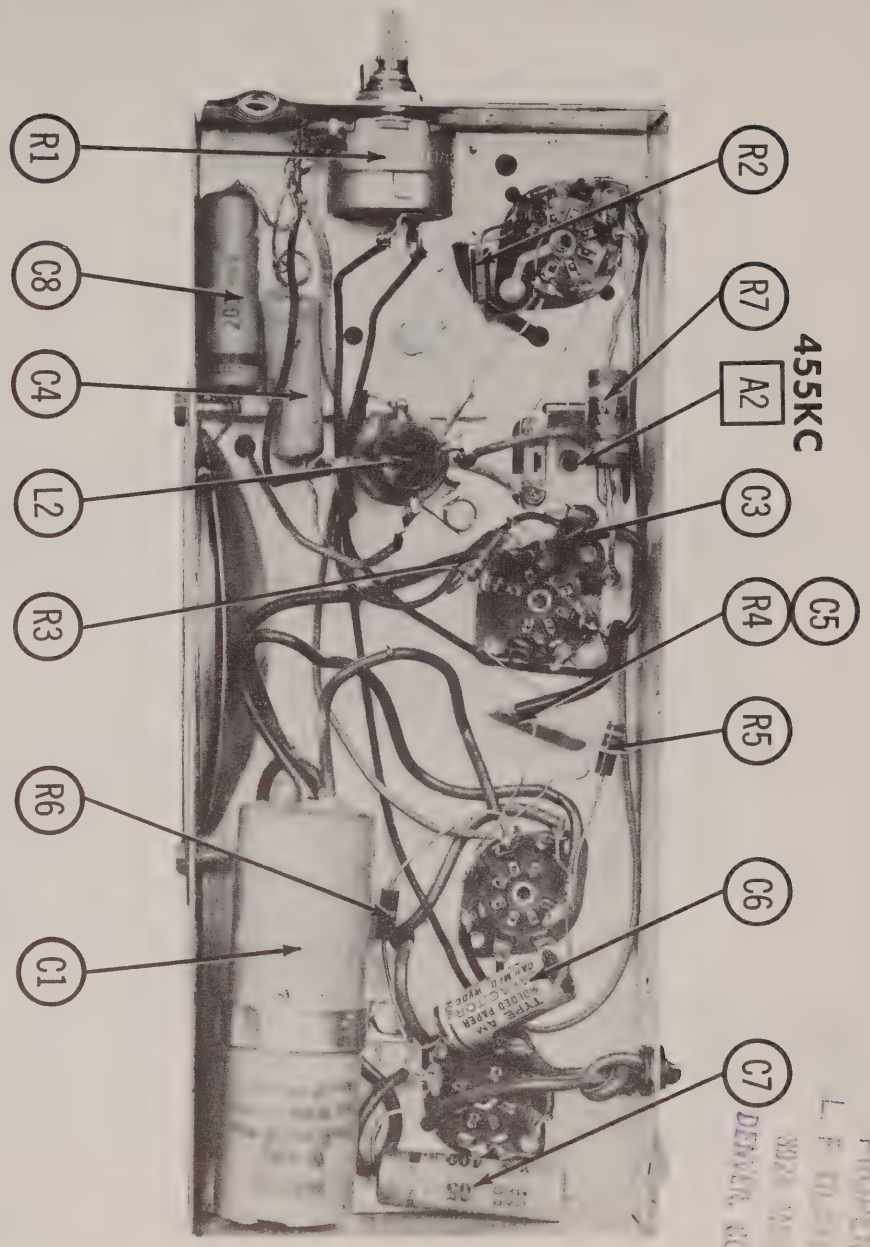
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	MITCHELL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	2Ω		N-8832				
L2	Osc. Coil	2.4Ω 1.1Ω	7.5Ω	N-8681				
L3	IF Coil	29Ω	29Ω	N-7694				Tapped ⑧ .9Ω

MISCELLANEOUS

ITEM No.	PART NAME	MITCHELL PART No.	NOTES
M1	Tuning Cap.	N-8675	21-380MMF, 15-120MMF

CHASSIS—BOTTOM VIEW



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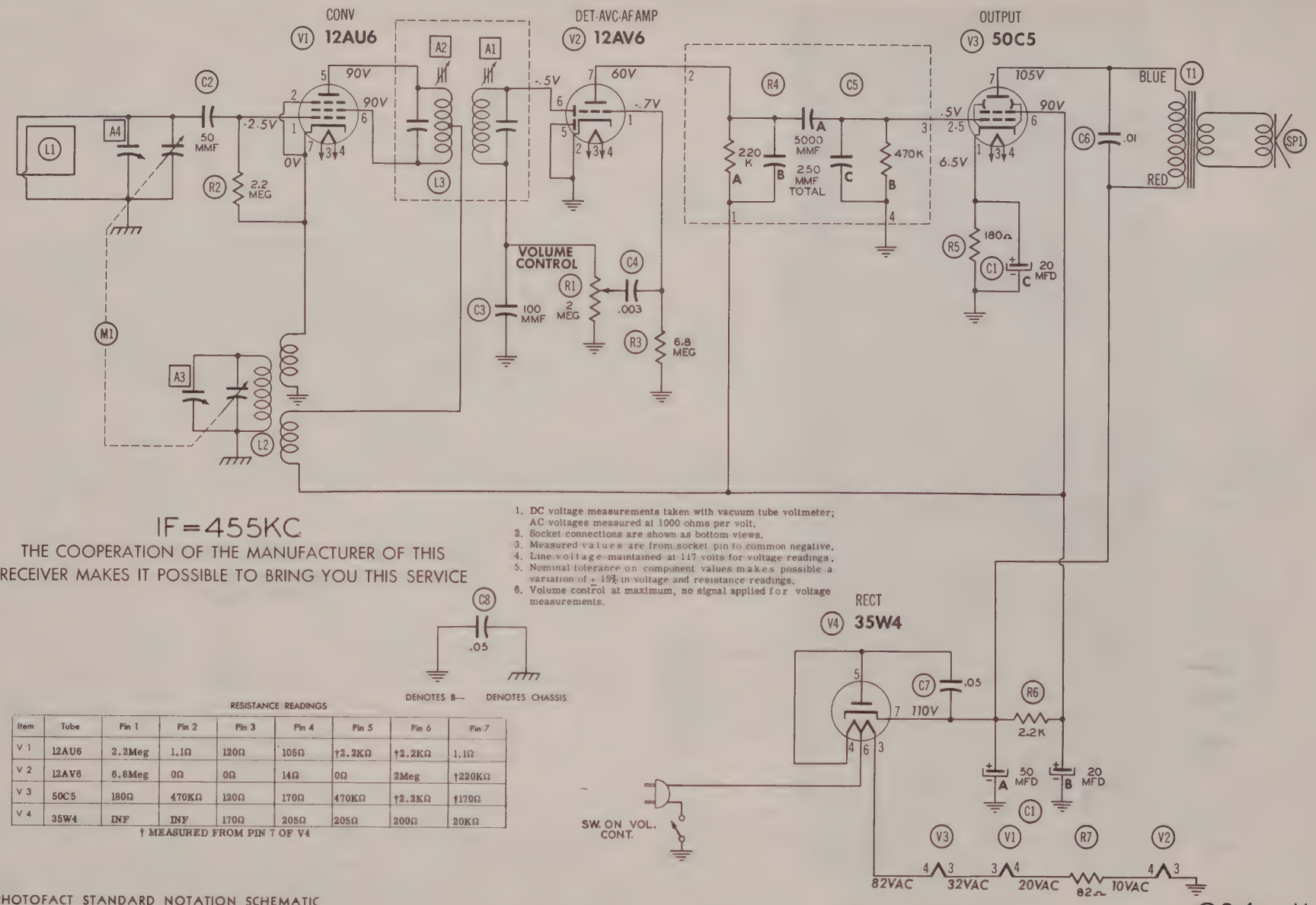
MITCHELL
MODEL 1258



IF=455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12AU6	2.2Meg	1.1Ω	120Ω	105Ω	†2.2KΩ	†2.2KΩ	1.1Ω
V 2	12AV6	6.8Meg	0Ω	0Ω	1Ω	0Ω	2Meg	†220KΩ
V 3	50C5	180Ω	470KΩ	120Ω	170Ω	470KΩ	†2.2KΩ	†170Ω
V 4	35W4	INF	INF	170Ω	205Ω	205Ω	200Ω	20KΩ

† MEASURED FROM PIN 7 OF V4

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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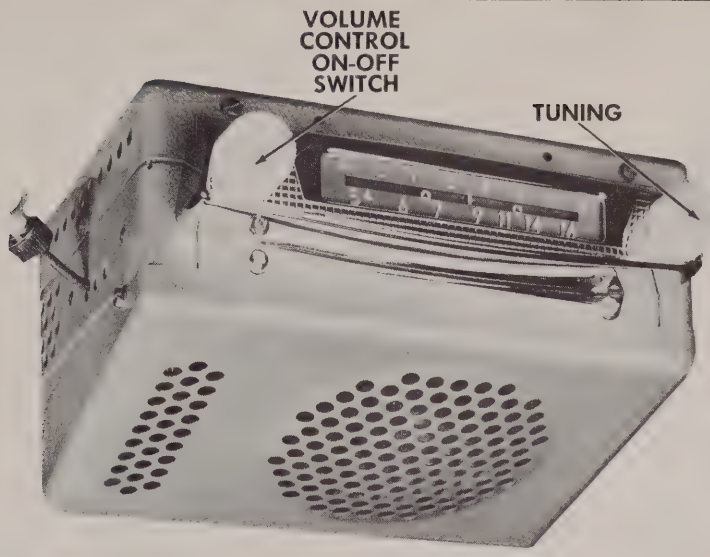

TRADE NAME	Motorola Model 404
MANUFACTURER	Motorola Inc., 4545 Augusta Blvd., Chicago 51, Ill.
TYPE SET	Battery Operated Universal Automobile AM Superheterodyne Receiver
TUBES (Six)	Types 6BD6 RF Amp., 6BE6 Conv., 6BD6 IF Amp., 6CR6 Det.-AVC-AF Amp., 6AQ5 Output, 6X4 Rectifier
POWER SUPPLY	6 Volt Storage Battery — RATING 5.8 Amp. @ 6.3 Volts DC
TUNING RANGE—BROADCAST	540-1605KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Attenuate generator output to maintain 1.8 volts on output meter. Use an insulated alignment screwdriver for adjusting.
To adjust the tuner cores construct two alignment tools similar to Fig. 2. To adjust grasp the cores between the rubber strip ends of the alignment tools and turn cores in the desired direction.
To set dial pointer tune to high frequency end stop and slide pointer to the right edge of "16" on the dial scale. It will be necessary to remove the dial cover front plate to make this adjustment.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	455KC (400~Mod)	High frequency end stop	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	Fig. 1	Thru dummy (Fig.1) to antenna receptacle	1605KC	"	"	A5	"
3.	"	"	1400KC	Tune to 1400KC	"	A6, A7	Adjust for maximum output. If tuner cores require adjustment omit step 3 and continue alignment with step 4. If tuner cores do not require adjustment continue alignment with step 6.
4.	"	"	1610KC	High frequency end stop	"	A5, A6, A7	If necessary, adjust cores so that they project 1 1/32" from ends of coil forms. Adjust in order given for maximum output.
5.	"	"	1400KC	Tune to 1400KC signal	"	A8, A9, A10	Adjust in order given for maximum output.
6.	With receiver installed in car and antenna fully extended tune in a weak station near 1400KC and adjust A7 for maximum volume. Adjustment may also be made for maximum noise between stations near 1400KC.						

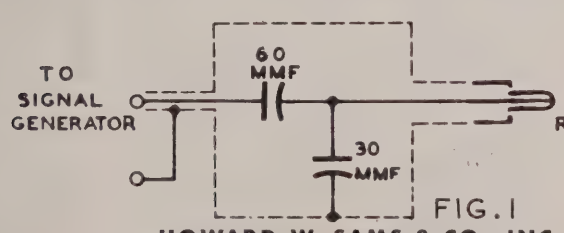

FIG. 1

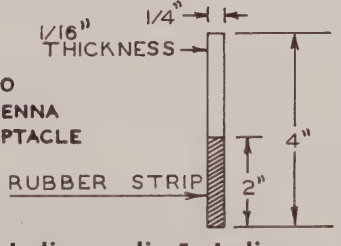

FIG. 2

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PARTS LIST AND DESCRIPTIONS

MOTOROLA MODEL 404

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	RF Amplifier	6BD6	6BD6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amplifier	6BD6	6BD6	7BK	
V4	Det.-AVC-AF Amp.	6CR6	6CR6	7EA	
V5	Output	6AQ5	6AQ5	7BZ	
V6	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	■15	350	23A485677	AFH3-104		C077		FP328	TVL-3630	
B	▲10	350								
C	20	25								
C2	90		21A591682							
C3	.006	100	8A4529	P688-006	D6-602	CUB6D6	GP2-333-602	PT626	6TM-D6	
C4	.05	100	8R13514	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C5	.05	400	6R14791	P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C6	5		21R115955	SI5	D6-050	TP06	NP0K-500	ZT-555	5GA-V5	
C7	47		21R115593	SI47N750	TCN-47	TN14	N750K-470		5TCU-Q47	
C8	.01	400	8R472754	P488-01	D6-103	CUB4S1	GP2-333-103	TP411	4TM-S1	
C9	.05	400	6R14791	P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C10	.01	400	8R23690	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C11	470		21R115850	SI470	D6-471	TP46	GP2K-471	UC-5347	5GA-T47	
C12	.0034	600	8K71909							
C13	.5	100	8K17028	VHC-36		PJ2P5		RF480	HC-2	
C14	.5	100	8K17028	VHC-36		PJ2P5		RF480	HC-2	
C15	.03	1000	8K400883	P1088-03		CUB10S3		PT1013	MB-S3	

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	250KΩ	½	18B531560	Q11-130	A47-250K-S	AB-50	U-46	Volume
B	Shaft		Not Req.	Not Req.	RS-2	AK-9	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-12	KB-4	US-26	Attach to R1A

RESISTORS

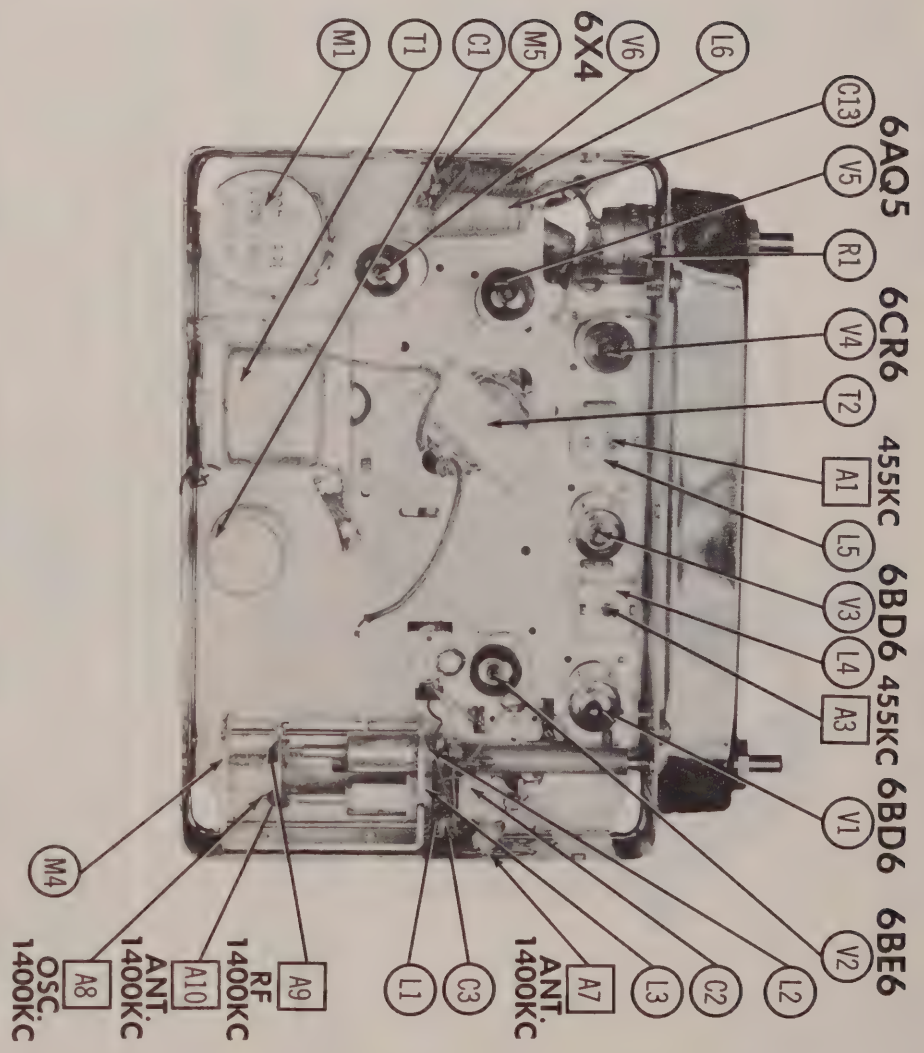
ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	NOTES
R2	1Meg	½	6R6004	BTS-1Meg	
R3	330Ω	½	6R6022	BTS-330	
R4	100KΩ	½	6R6075	BTS-100K	
R5	47KΩ	½	6R6056	BTS-47K	
R6	470Ω	½	6R6090	BTS- 470	
R7	6800Ω	2	6R5690	BTB-6800	
R8	1Meg	½	6R6004	BTS-1Meg	
R9	2.2Meg	½	6R3927	BTS-2.2Meg	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	NOTES
R10	1Meg	½	6R6004	BTS-1Meg	
R11	220KΩ	½	6R6015	BTS-220K	
R12	270KΩ	½	6R6414	BTS-270K	
R13	270Ω	½	6R6432	BTS-270	
R14	2200Ω	2	6R5687	BTB-2200	
R15	56Ω	1	6R2037		
R16	56Ω	1	6R2037		

TRANSFORMER (VIBRATOR)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: MOTOROLA PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	6.3VAC @2.3A	450VCT .042ADC			25C501303-G		P-3068	V-16K		

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T2	5.2KΩ	3.2Ω	25B70171-N	A-3877	A-2930	S-3X	Z1107	24S51	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	JENSEN PART No.	QUAM PART No.	
SP1	5 1/4"	PM	3.2Ω	50K521682 50K522339 ①	ST-803 Mod. P525-V	52A1	① Alternate 5 1/4" PM speaker

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	MOTOROLA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	12Ω		24B502472				Part of complete tuner
L2	RF Coil	12Ω		24B502473				
L3	Osc. Coil	.6Ω	2.5Ω	24B502474				
L4	Input IF	16Ω	16Ω	24C485553	16-6758	BC-352	12-C1	
L5	Output IF	16Ω	16Ω	24K485554	16-6758	BC-353	12-C2	
L6	Fil. Choke	0Ω		24K580706				
L7	Vib. Hash Choke	0Ω		24A472535		BC-537	5221	15.2 Microhenries

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FRE-QUENCY	REPLACEMENT DATA				NOTES
				MOTOROLA PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	6.3V	115∿	48B3333	5342	859	5342	

FUSES

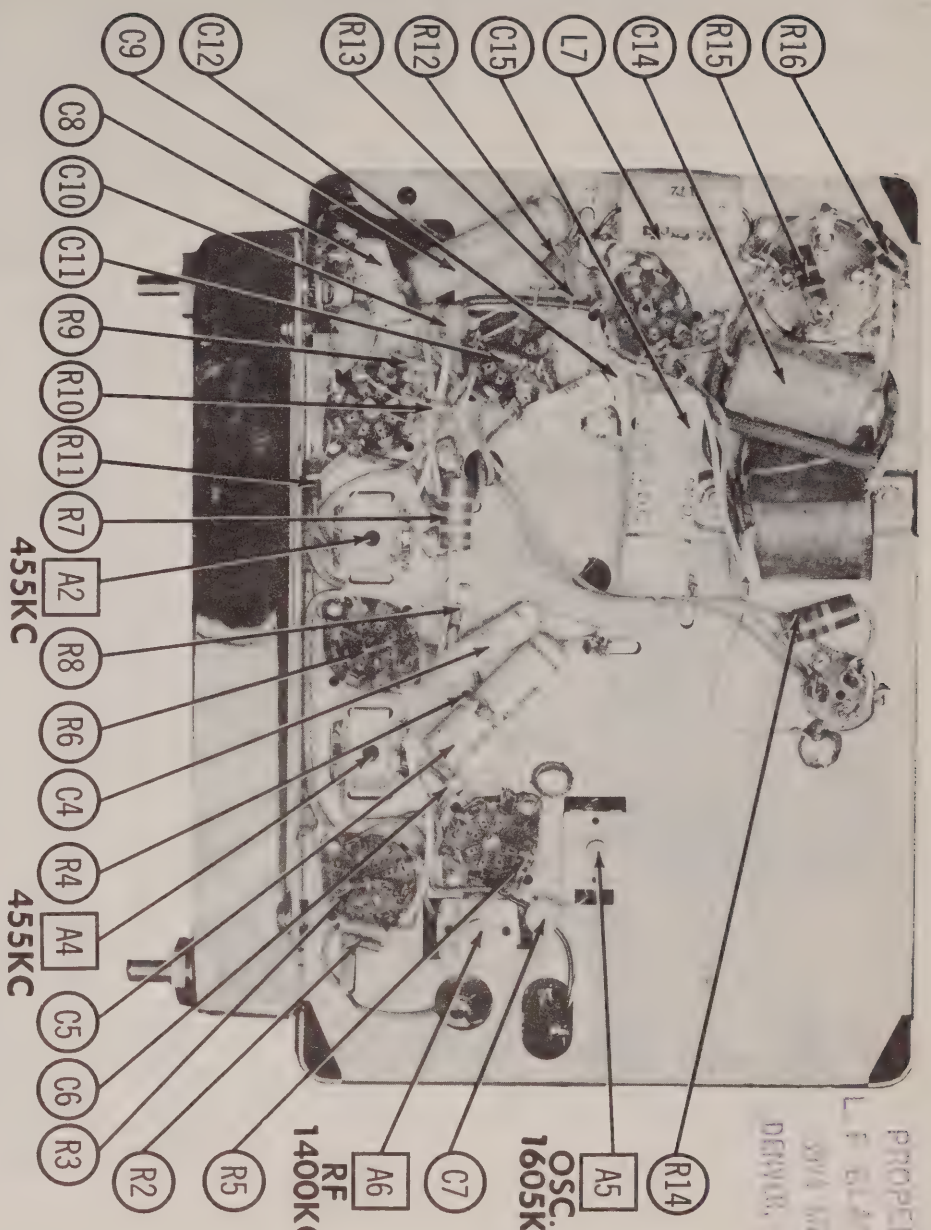
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	SFE	9A 32V	65K16248	9K592648 *	307009 (9A-SFE)	155009	SFE9	HRH *

* Includes fuse complete with holder

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M3	Dial Light	65X10867	Bayonet #44
M4	Tuning Unit	51D502490	Complete - Model MT-87
M5	Spark Plate	1V500379	
A7	Trimmer Cap.	20A502338	Ant. (50-180MMF)
A6	Trimmer Cap.	20A481526	RF (20-180MMF)
A5	Trimmer Cap.	20A485708	Osc. (395-470MMF)
	Knob	36K521779	Tuning & volume
	Dial Scale	34K502385	

CHASSIS—BOTTOM VIEW



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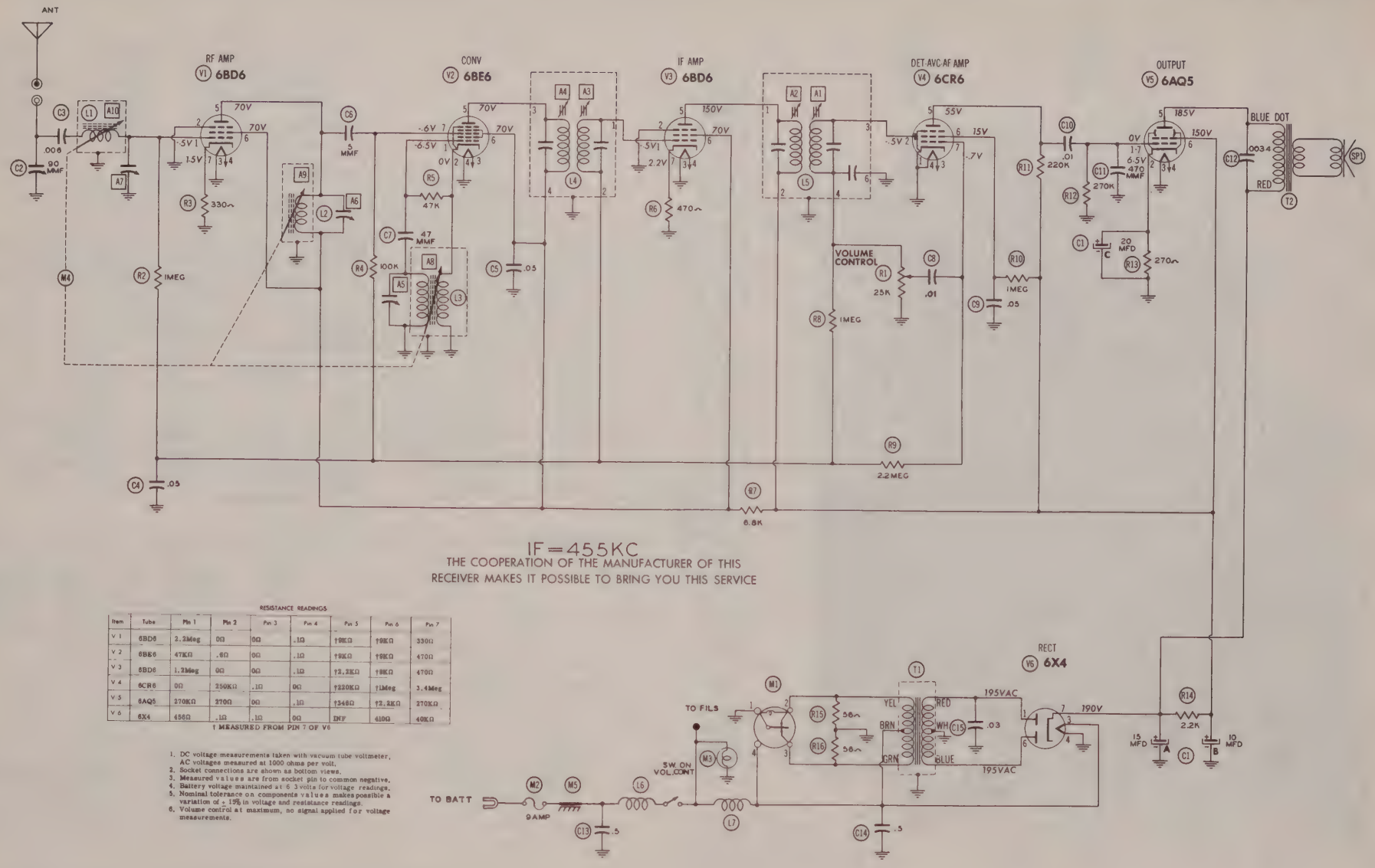
MOTOROLA MODEL 404



IF = 455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	6BD6	2.2Meg	0Ω	0Ω	.1Ω	†9KΩ	†9KΩ	330Ω
V2	6BE6	47KΩ	.6Ω	0Ω	.1Ω	†9KΩ	†9KΩ	470Ω
V3	6BD6	1.2Meg	0Ω	0Ω	.1Ω	†3.3KΩ	†9KΩ	470Ω
V4	6CR6	0Ω	250KΩ	.1Ω	0Ω	†220KΩ	†1Meg	3.4Meg
V5	6AQ5	270KΩ	270Ω	0Ω	.1Ω	†340Ω	†2.2KΩ	270KΩ
V6	6X4	450Ω	.1Ω	.1Ω	0Ω	INF	410Ω	40KΩ

† MEASURED FROM PIN 7 OF V6

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 6.3 volts for voltage readings.
5. Nominal tolerance on components values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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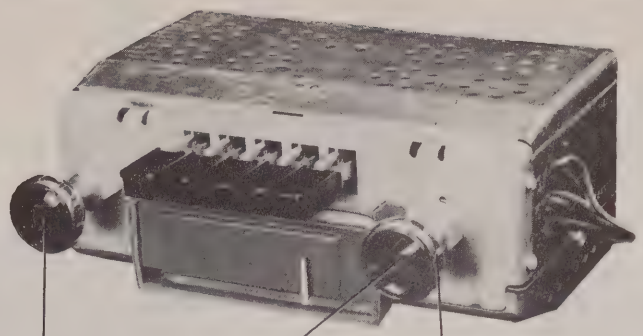

TRADE NAME	Nash Model AC-154 (Motorola Model NH4AC) (For 1954 Nash "Ambassador" & "Statesman" Automobiles)
MANUFACTURER	Motorola, Inc., 4545 Augusta Blvd., Chicago 51, Ill.
TYPE SET	Battery Operated Custom Built AM Superheterodyne Automobile Receiver
TUBES (Six)	Types 6BA6 RF Amp., 6BE6 Conv., 6BA6 IF Amp., 6AT6 Det-AVC-AF Amp., 6BQ5 Output, 6X4 Rectifier
POWER SUPPLY	6 Volts Storage Battery — RATING 6.8 Amp. @ 6.3Volts DC
TUNING RANGE—BROADCAST	540 - 1605KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Attenuate generator output to maintain 1.8 volts on output meter. Use an insulated screwdriver for adjusting.
Use Motorola alignment tool #66A76278 (or equivalent) for adjusting tuner cores.
CAUTION: Do not exert inward pressure on tuner core alignment tool as tuner carriage may move resulting in inaccurate alignment.
If tuner core alignment is necessary the pointer assembly and dial backplate assembly must be removed.
If necessary, set dial pointer to 1300KC (steps 3 or 5) with dial pointer adjustment screw.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1MFD	High side to pin 7 (grid) of 6BE6 (V2).. Low side to chassis.	455KC (400~ Mod.)	High frequency end stop.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2	Fig. 1	Thru dummy (Fig. 1) to antenna receptacle.	1605KC	"	"	A5	"
3	"	"	1300KC	Tune to 1300KC signal.	"	A6, A7	Adjust for maximum output. If tuner core adjustment is necessary, omit step 3 and continue alignment with step 4. If tuner cores do not require adjustment, continue alignment with step 7.
4	"	"	1605KC	High frequency end stop.	"	A5, A6, A7	Back out tuner cores so they will not affect trimmers. Adjust in order given for maximum output.
5	"	"	1300KC	Using tuning control move carriage in 5/16" from position in step 4.	"	A8, A9, A10	Adjust in order given for maximum output.
6	"	"	1605KC	Tune to 1605KC signal.	"	A5, A6, A7	Adjust for maximum output.
7	With radio installed in car, tune to a weak station near 1400KC and adjust A7 for maximum volume.						

PUSH BUTTON ASSEMBLY

Pull the selected pushbutton all the way out.
Tune manually to the desired station.
Press the push button all the way in.
Repeat procedure for remaining push buttons.

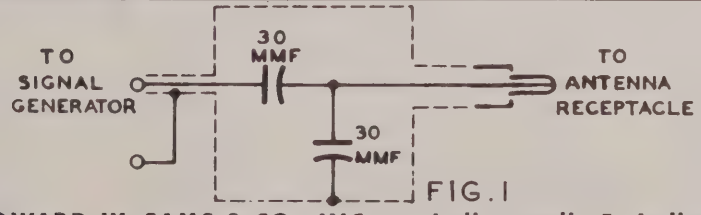

FIG. 1

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
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PARTS LIST AND DESCRIPTIONS

NASH
MODEL AC-154

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		MOTOROLA PART No.	STANDARD REPLACEMENT		
V1	RF Amp.	6BA6	6BA6	7BK	
V2	Conv.	6BE6	6BE6	7CH	
V3	IF Amp.	6BA6	6BA6	7BK	
V4	Det-AVC-AF Amp.	6AT6	6AT6	7BT	
V5	Output	6AQ5	6AQ5	7BZ	
V6	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■15	350	23A485677	AFH3-104		C077		FP328	TVL-3630	
B	▲10	350								
C	20	25								
C2	.047	200	8R121005	P288-047	DF-502	PJ2S47		PT4147	2TM-S47	
C3	90		21A591682							
C4	.0056	400	8R121001							
C5	.1	400	8K121006	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C6	5		21R115955	SI5	D6-050	TP06	GP1K-050	ZT-555	5GA-V5	
C7	.01	600	8K121002	P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C8	5		21R115955	SI5	D6-050	TP06	GP1K-050	ZT-555	5GA-V5	
C9	.0056	400	8R121001							
C10	.022	200	8R121003	P288-02	DD-203	PJ2S2		PT412	2TM-S2	
C11	.01	400	8R121002	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C12	470		21R115856	SI470	D6-471	TP46	GP2L-471	UC-5347	5GA-T47	
C13	.0039	400	8R121000							
C14	.5	100	8K17028	VHC-36		PJ2P5		RF480	HC-2	
C15	.5	100	8K17028	VHC-36		PJ2P5		RF480	HC-2	
C16	.022	1000	8R121004	P1088-02		CUB16S2		PT1012	MB-S2	
C17	47		21R115593	SI47N750		TN14		NT-5447	5TCU-Q47	
C18	220		21K511959	SI220	D6-221	TP39	GP2L-221	UC-5322	5GA-T22	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	250KΩ	½	18B512285	*QJ-358A			UF254-T753	Volume tapped at 70KΩ Panel
B	1Meg	½					UR16L	Tone Rear
C	Switch						US-26	Attach to R1B

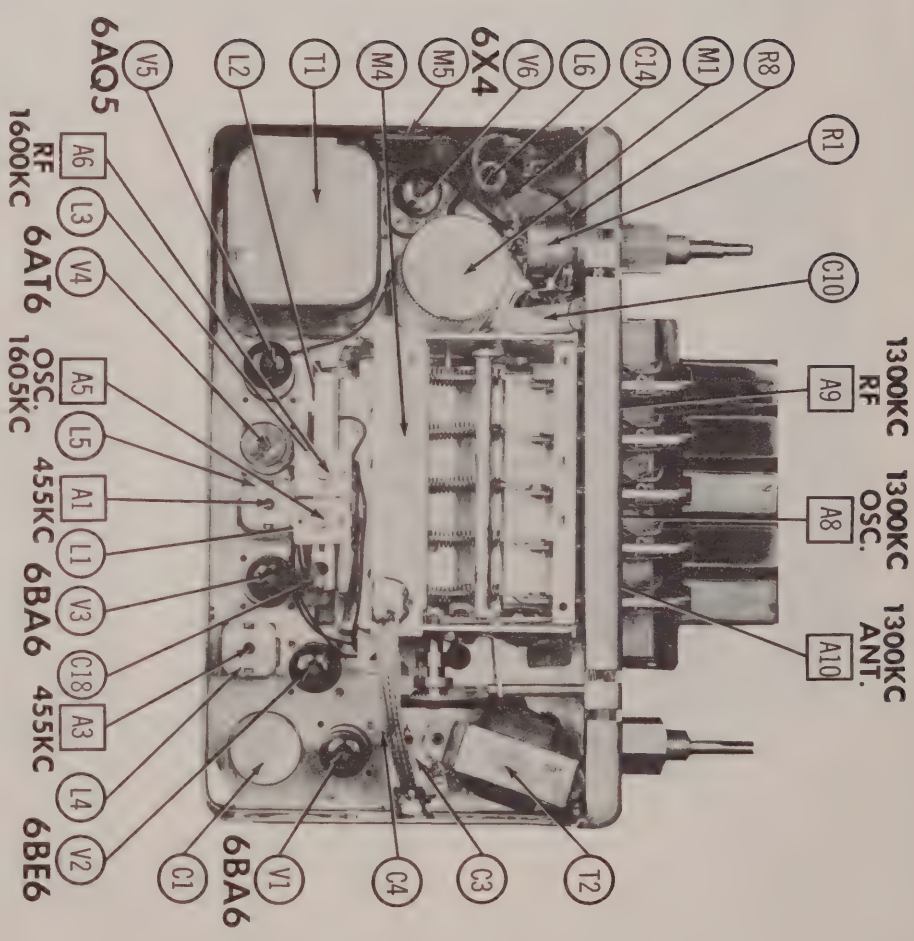
* CONCENTRIKIT EQUIVALENT: KIT K-2 BASE ELEMENTS & SHAFTS B18-130X &P1-121 (PANEL)
B11-137 & R1-202 (REAR)
SWITCH 76-1

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R2	470KΩ	½	6R6032	BTS-470K	
R3	150Ω	½	6R3992	BTS-150	
R4	100KΩ	½	6R6075	BTS-100K	
R5	33KΩ	½	6R6012	BTS-33K	
R6	3900Ω	2	6R476012	BTB-3900	
R7	270Ω	½	6R6432	BTS-270	
R8	12KΩ	½	6R6394	BTS-12K	
R9	47KΩ	½	6R6056	BTS-47K	
R10	1Meg	½	6R6004	BTS-1Meg	
R11	1Meg	½	6R6004	BTS-1Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R12	4.7Meg	½	6R2122	BTS-4.7Meg	
R13	2700Ω	½	6R5577	BTS-2700	
R14	470KΩ	½	6R6032	BTS-470K	
R15	220KΩ	½	6R6015	BTS-220K	
R16	270Ω	1	6R6336	BTA-270	
R17	2200Ω	2	6R476134	BTB-2200	
R18	56Ω	½	6R5614	BTS-56	
R19	56Ω	½	6R5614	BTS-56	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	MOTOROLA PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	6.3VCT ⑧ 3A	430VCT .045A			25B530178-0	P-6471 ①	P-4071			

① Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T2	5.1KΩ	1.8Ω	25C472533	A-3850	A-2930	S-3X	Z1004	24S51	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	VIKING PART No.	QUAM PART No.	
SP1	5X7"	PM	3.6Ω	50K530293	57J9	57A1	
2	5X7"	PM	3.6Ω	50K530293	57J9	57A1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	MOTOROLA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	12Ω		24B580570				Part of complete tuner
L2	RF Coil	12Ω		24K580571				
L3	Osc. Coil	.9Ω	4.4Ω	24B501459				
L4	Input IF	16Ω	16Ω	24C485553	16-6758	BC-352	12-C1	
L5	Output IF	16Ω	16Ω	24K485555	16-6770	BC-355	12-C6	
L6	Fil. Choke	0Ω		24K592269				
L7	Vib. Hash Choke	0Ω		24A472535		BC-537	5221	

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				MOTOROLA PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interupter	6.3V	115∿	48B3333	5342	859	5342	

FUSES

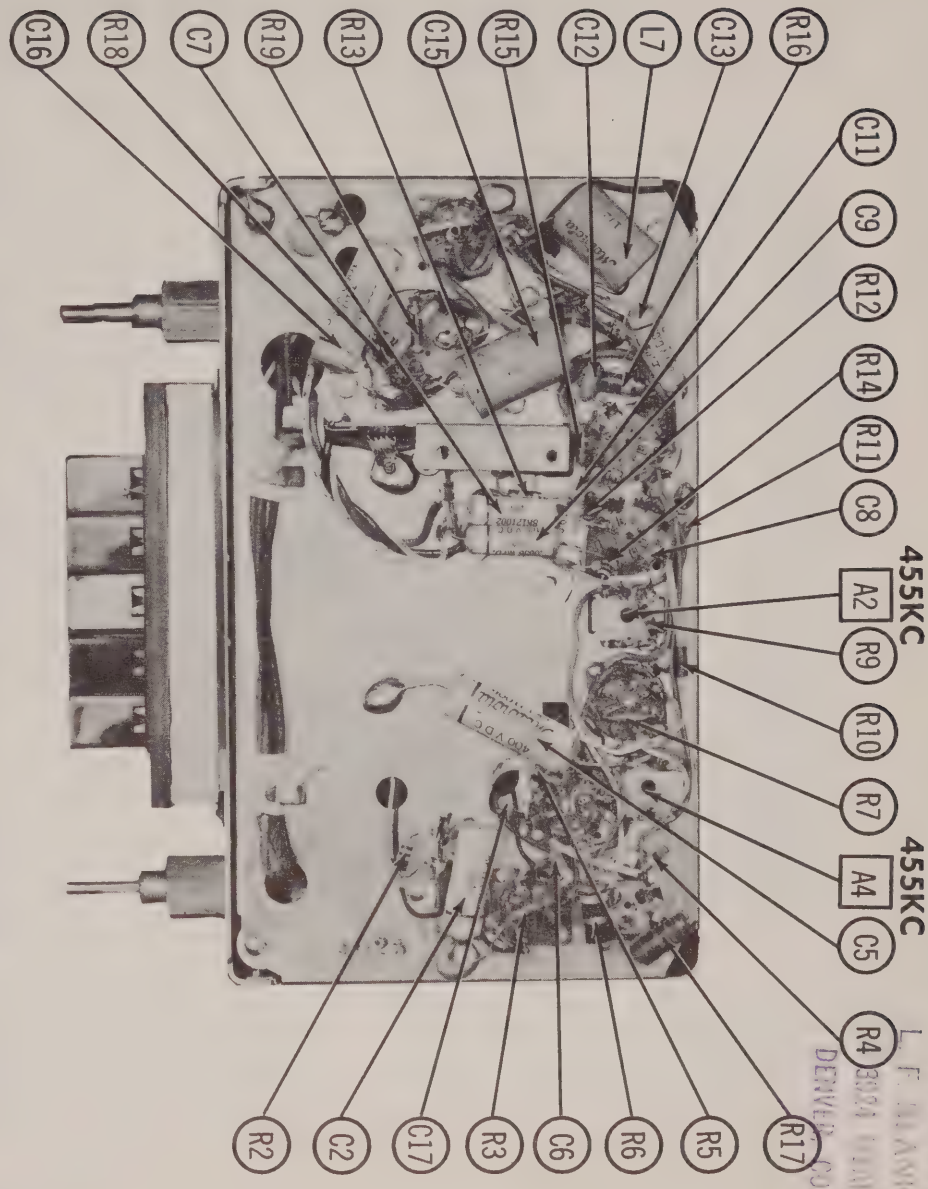
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	SFE	14A	65K12894	9K512927*	307014 (SFE-14A)	155014	SFE14	HPI

*Complete with fuse.

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M3	Dial Light	65X10867	Bayonet #44
M4	Tuning Unit	51D512340	Complete
M5	Spark plate	1A521478	Plates & insulators in riveted assy.
	Spark plate	64K531672	Copper foil type (2 used)
A5	Trimmer Cap.	20A77537	Osc. (5-88MMF)
A6	Trimmer Cap.	20A481526	RF (20-180MMF)
A7	Trimmer Cap.	20A501419	Ant. (50-280MMF)
	Knob	1V503006	On-off-volume
	Knob	36A500657	Tuning
	Knob	36B500638	Tone

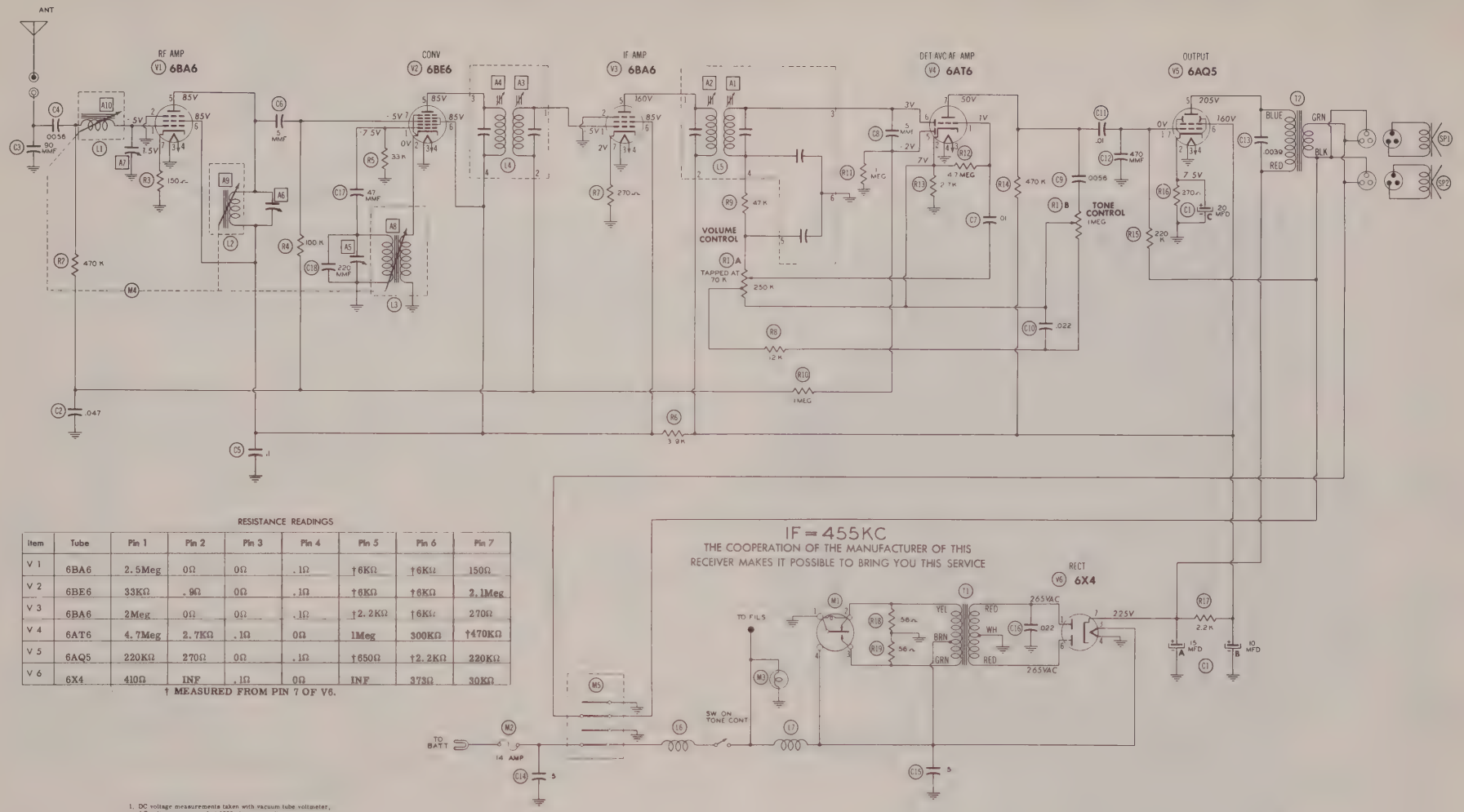
CHASSIS—BOTTOM VIEW



NASH
MODEL AC-154

SET 264 FOLDER 13

NASH
MODEL AC-154



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BA6	2.5Meg	0Ω	0Ω	.1Ω	†6KΩ	†6KΩ	150Ω
V 2	6BE6	33KΩ	.9Ω	0Ω	.1Ω	†6KΩ	†6KΩ	2.1Meg
V 3	6BA6	2Meg	0Ω	0Ω	.1Ω	†2.2KΩ	†6KΩ	270Ω
V 4	6AT6	4.7Meg	2.7KΩ	.1Ω	0Ω	1Meg	300KΩ	†470KΩ
V 5	6AQ5	220KΩ	270Ω	0Ω	.1Ω	†650Ω	†2.2KΩ	220KΩ
V 6	6X4	410Ω	INF	.1Ω	0Ω	INF	373Ω	30KΩ

† MEASURED FROM PIN 7 OF V6.

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative
4. Battery voltage maintained at 6.3 volts for voltage readings.
5. Nominal tolerance on components values makes possible a variation of ± 10% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT STANDARD NOTATION SCHEMATIC
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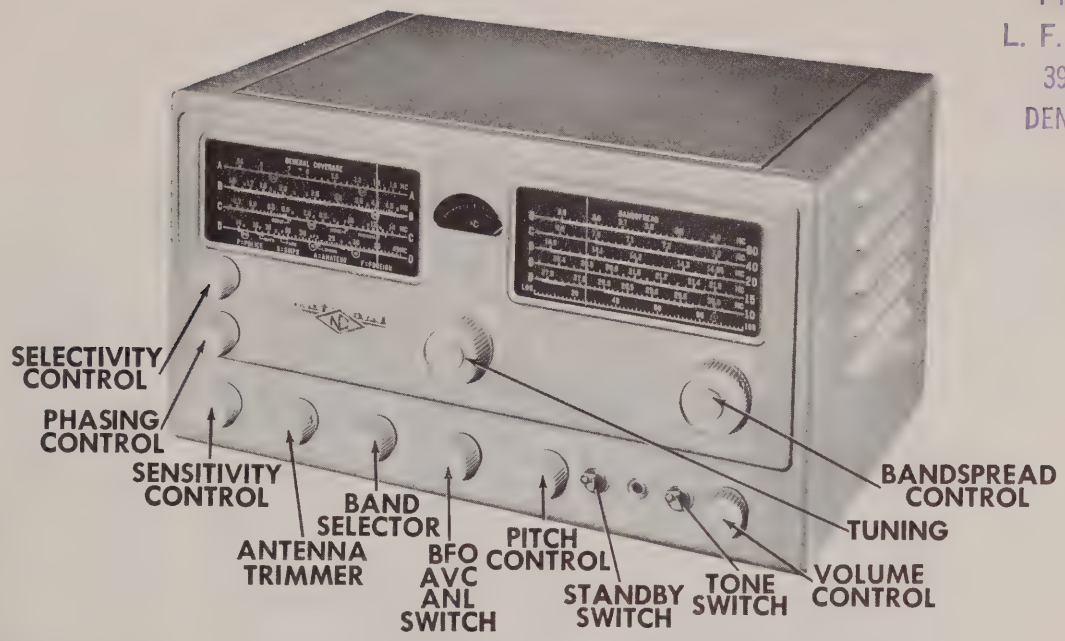
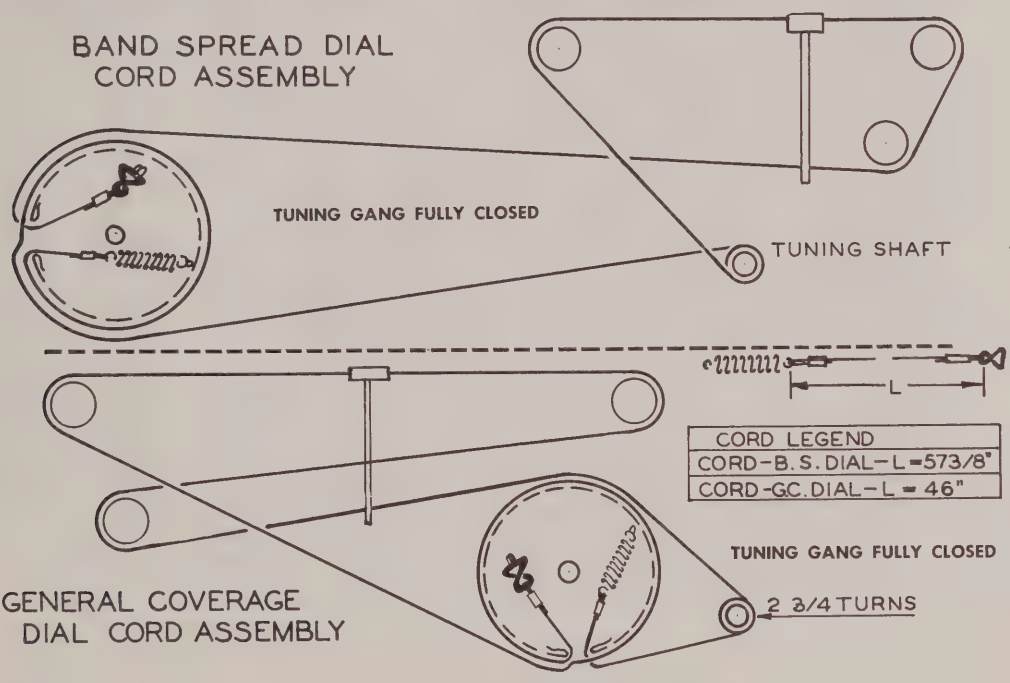
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



TRADE NAME	National Model NC-98
MANUFACTURER	National Co., Inc., 61 Sherman St., Malden 48, Mass.
TYPE SET	AC Operated Multi-Band Superheterodyne Communications Receiver
TUBES	Nine
POWER SUPPLY	105-130 Volts AC - 50/60 Cycles RATING .6 Amp. @ 117 Volts AC
TUNING RANGE	Band "A" 540-1600KC Band "C" 4.7 -14MC Band "B" 1.6 - 4.7MC Band "D" 14 - 40MC



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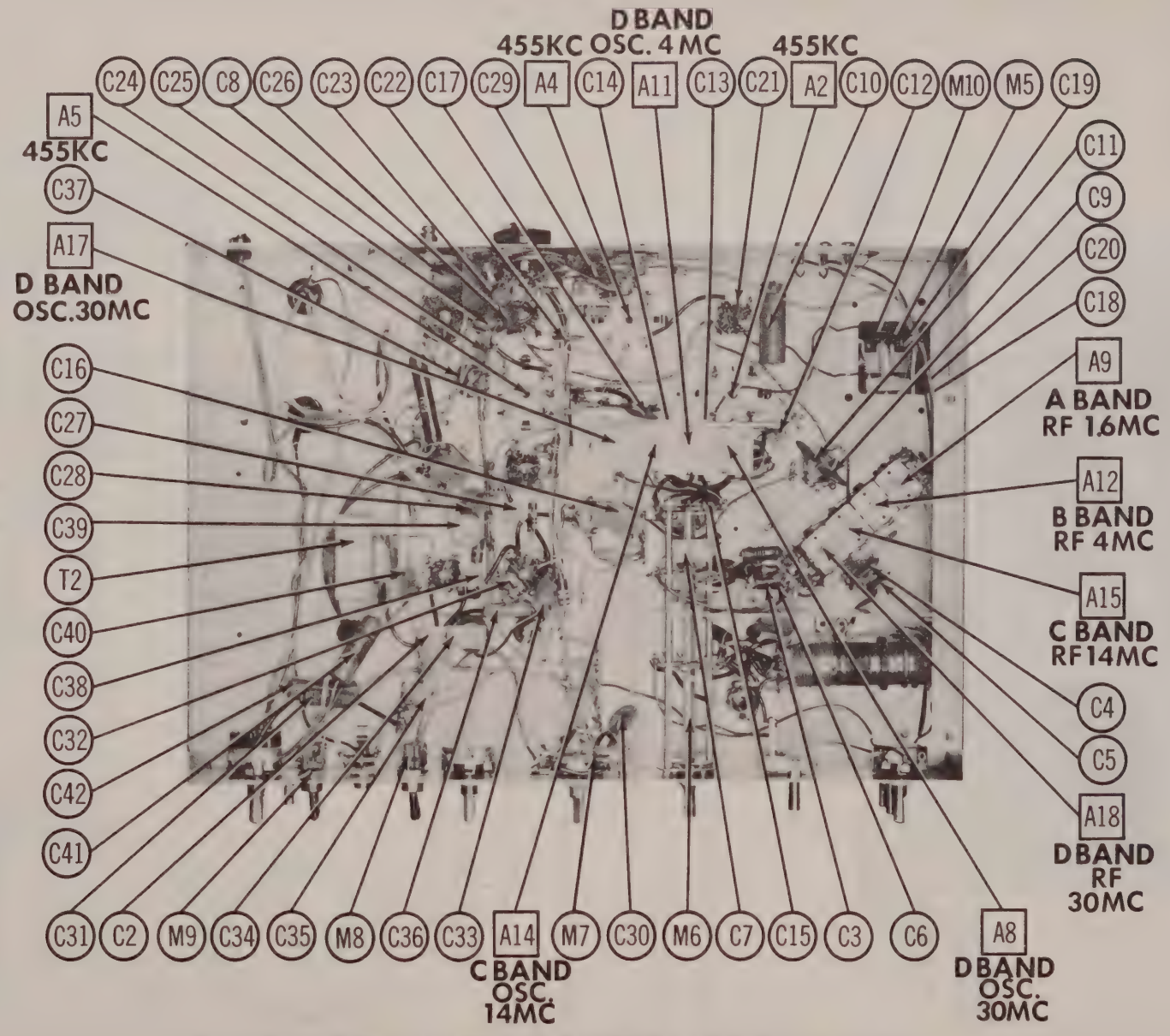
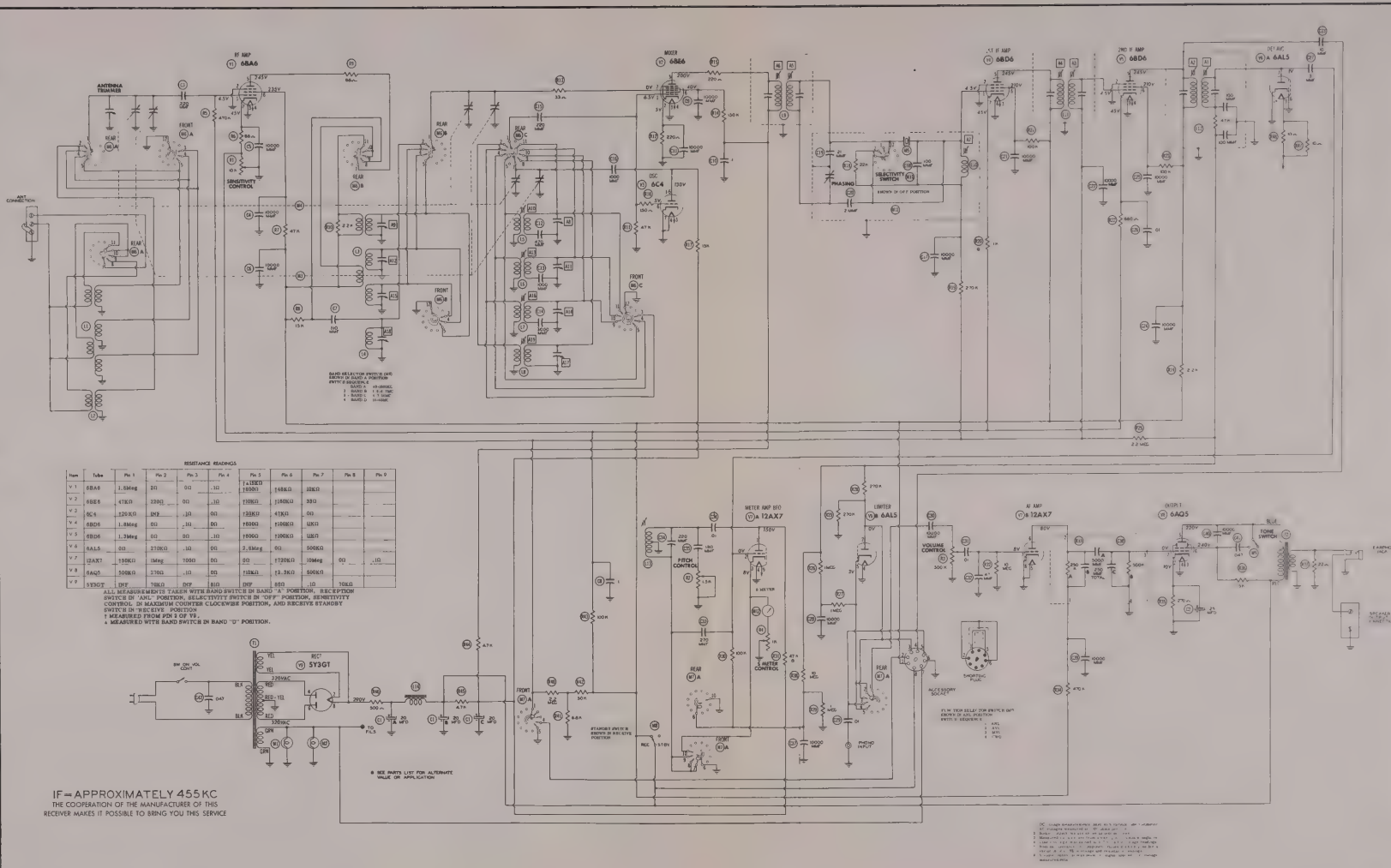


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION


RF AMP V1 6BA6
MIXER V2 6BE6
OSC V3 6C4
1ST IF AMP V4 6BD6
2ND IF AMP V5 6BD6
DET AVC V6 6AL5
METER AMP REG V7 A 12AX7
LIMITER V8 6AL5
AF AMP V9 A 12AX7
OUTPUT V10 6AQ5
REC V11 5Y3GT
ANTENNA TRIMMER
SENSITIVITY CONTROL
PHASING
SELECTIVITY SWITCH
VOLUME CONTROL
TONE SWITCH
FINE TUNING
METER CONTROL
PITCH CONTROL
ACCESSORY SOCKET
PHONO INPUT
EARPHONE JACK
SPEAKER VOICE COIL FINGER TABS
IF = APPROXIMATELY 455 KC
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
RESISTANCE READINGS
ALL MEASUREMENTS TAKEN WITH BAND SWITCH IN BAND "A" POSITION, RECEPTION SWITCH IN "ANL" POSITION, SELECTIVITY SWITCH IN "OFF" POSITION, SENSITIVITY CONTROL IN MAXIMUM COUNTER CLOCKWISE POSITION, AND RECEIVE STANDBY SWITCH IN "RECEIVE" POSITION
† MEASURED FROM PIN 2 OF V9.
▲ MEASURED WITH BAND SWITCH IN BAND "D" POSITION.
* SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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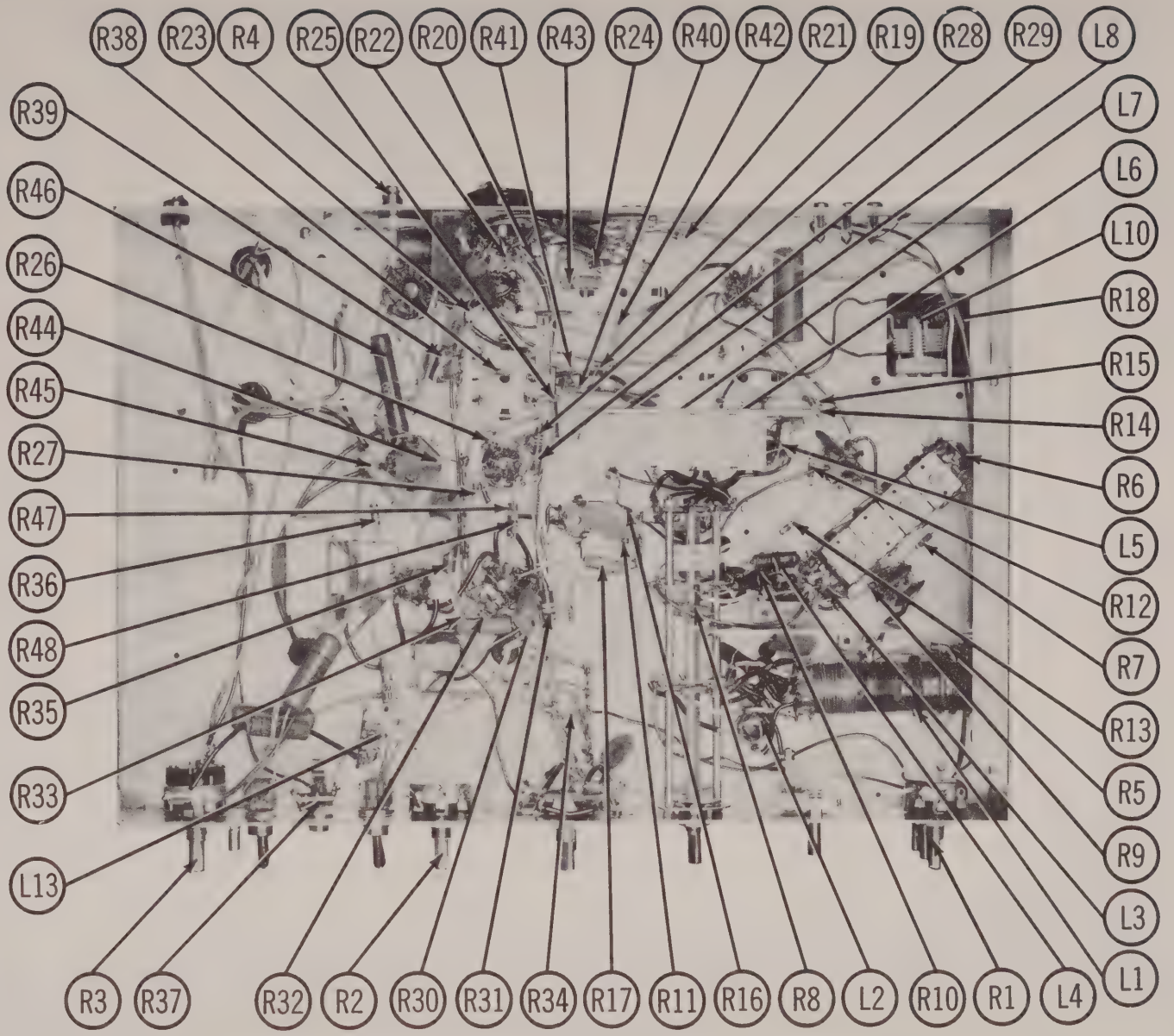
264-14



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

NATIONAL
MODEL NC-98

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Only qualified technicians thoroughly familiar with communications type receivers should attempt alignment of this receiver. Alignment should not be attempted until a thorough check of receiver performance against normal performance has been made.
With main tuning gang fully closed, slide dial pointer to coincide with the last low frequency mark on the "C" scale. With the band spread tuning capacitor fully closed, set band spread dial pointer to coincide with the "O" index mark on the log scale.
Allow a 15 minute warm-up period for receiver and test equipment.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

IF ALIGNMENT

The IF frequency is 455KC ±2KC. The crystal used in the crystal filter determines the exact IF frequency.
Connect speaker (or 4Ω resistor) across speaker terminals on rear chassis apron.
Pre-set the front panel controls as follows:

a. Switch selectivity to "Off" position.
b. Adjust phasing control so that red dot is at top of knob.
c. Turn sensitivity control maximum clockwise.
d. Turn reception switch to "AVC" position.
e. Place "Receive-standby" switch in "Receive" position.
f. Turn the AC - "Off-Volume" control fully clockwise.
g. Remove the antenna from the antenna terminals and turn the **"Meter Adjust" control (rear chassis apron)** until the "S" meter (front panel) reads zero.
h. Switch the reception switch from position in Step d-to "CWO".
i. Change the selectivity switch from position in Step a. to position 2.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to mixer stator lug (mid-section) on main tuning gang. Low side to chassis.	Approx. 455KC (Unmod)	"A"	Tuning gang fully open	Across speaker terminals (rear chassis apron)		Adjust pitch control for audible beat in speaker. Slowly vary signal generator between 453 and 457KC until output meter shows a very sharply peaked response. It may be necessary to back off the sensitivity control or attenuate the signal generator output to obtain this peak. The peak indicates the frequency of the crystal and IF alignment should be made at this frequency.
2.	"	"	Exact frequency determined in step 1 (400∿Mod)	"	"	"	A1, A2, A3, A4 A5, A6	Turn "Reception" switch to "AVC" and "Selectivity" switch to "Off". Adjust in order given until maximum output is obtained.
3.	"	"	Tune 2KC higher than frequency determined in step 1.	"	"	"	A7	Change selectivity switch to position 1. Adjust for maximum output.

RF ALIGNMENT

The oscillator operates on the high side on the "A", "B" and "C" bands and on the low side on the "D" band.
Place the band spread dial pointer at "Set" on the log scale.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
4.	300Ω carbon resistor	High side thru 300Ω to ungrounded antenna terminal. Low side to chassis.	1.6MC (400∿Mod)	A	1.6MC	Across speaker terminals	A8, A9	Adjust in order given for maximum output.
5.	"	"	0.6MC	"	0.6MC	"	A10	Adjust for maximum output. Repeat steps 4 and 5.
6.	"	"	4.0MC	B	4.0MC	"	A11, A12	Adjust in order given for maximum output.
7.	"	"	1.6MC	"	1.6MC	"	A13	Adjust for maximum output. Repeat steps 6 and 7.
8.	"	"	14.0MC	C	14.0MC	"	A14	Adjust for maximum output. If two peaks occur use the one closest to MINIMUM capacity.
9.	"	"	"	"	"	"	A15	Adjust for maximum output. If two peaks occur use the one closest to maximum capacity.
10.	"	"	5.0MC	"	5.0MC	"	A16	Adjust for maximum output. Repeat steps 8, 9 and 10.
11.	"	"	30MC	D	30.0MC	"	A17	Adjust for maximum output. If two peaks occur use the one closest to maximum capacity.
12.	"	"	"	"	"	"	A18	Adjust for maximum output. If two peaks occur use the one closest to MINIMUM capacity.
13.	"	"	15.0MC	"	15.0MC	"	A19	Adjust A19 fully counter clockwise, then clockwise until second peak occurs. Adjust for maximum output on second peak. Repeat steps 11, 12 and 13.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		NATIONAL PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BA6	6BA6	6BK	
V2	Mixer	6BE6	6BE6	7CH	
V3	Oscillator	6C4	6C4	6BG	
V4	1st. IF Amplifier	6BD6	6BD6	7BK	
V5	2nd. IF Amplifier	6BD6	6BD6	7BK	
V6	Det.-AVC-Limiter	6AL5	6AL5	6BT	
V7	Meter Amp-BFO-AF Amplifier	12AX7	12AX7	9A	
V8	Output	6AQ5	6AQ5	7BZ	
V9	Rectifier	5Y3GT	5Y3GT	5T	

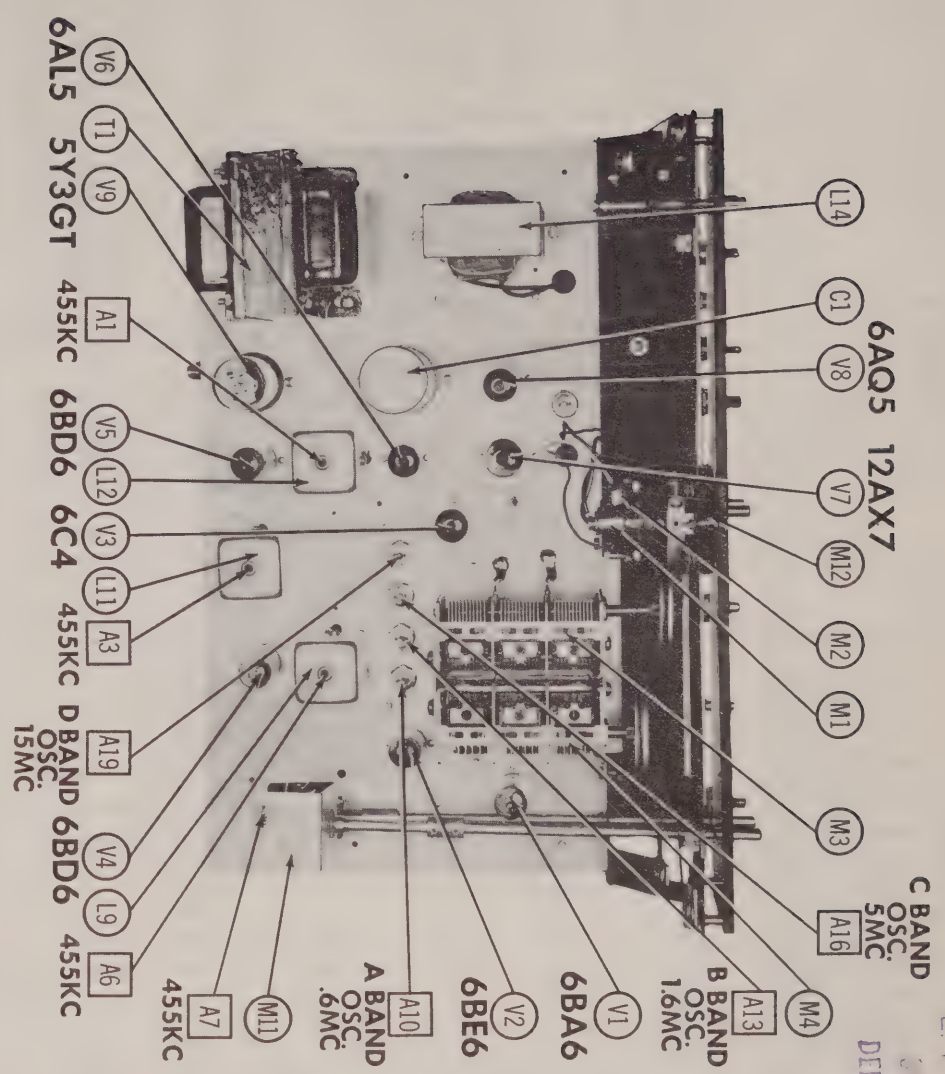
CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	NATIONAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▲20	450	H235-2	AFH3-36		C027		FP376.5	TVL-3780	
B	■20	450								
C	▲20	450								
C2	25	50	E338-4	PRS50/25		BR255		TC36	TVA-1306	
C3	220	500	J665-44	1469-0002		22R5T22		MCE240	MS-32	
C4	10000		K946-2	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C5	10000		K946-2	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C6	1000		K946-2	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C7	510	500	J665-57	1469-0005		5R5T51		MCE245	MS-35	
C8	.1	400	Q693-34	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C9	10000		K946-2	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C10	.1	400	Q693-34	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C11	10000		K946- 2	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C12	470		J665-55	1469-0005		5R5T47		MCE245	MS-35	
C13	1000		J665-70	1464-001		IR5 D1		MCE255	MS-21	
C14	3000		J660-3 0	1464-003		IR5D3		MCE461	MS-23	
C15	220	500	J665-44	1469-0002		22R5T22		MCE240	MS-32	
C16	1000	500	J666-14	1464-001		IR5D1		MCE255	MS-21	
C17	10000		K946-2	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C18	100	500	J665-32	1469-0001		22R5T1		MCE235	MS-31	
C19	21		D825D-410							
C20	2		F912-3							
C21	10000		K946-2	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C22	10000		K946-2	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C23	10		J695-2	SI10	D6-100	TP09	GP1K-100	UC-541	5GA-Q1	
C24	10000		K946-2	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C25	10000		K946-2	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C26	.01	400	Q693-19	P488-01	DF-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C27	3		J695-4							
C28	10000		K946-2	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C29	.01	400	Q693-19	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C30	10000		K946-2	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C31	.01	400	Q693-19	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C32	47		D825D-447	SI47	D6-470	TP29	GP1K-470	UC-5347	5GA-Q47	
C33	270	500	J665-47	1469-00025		22R5T25		MCE240	MS-33	
C34	220	500	J665-44	1469-0002		22R5T22		MCE240	MS-32	
C35	180	500	J665-41	1469-0002		22R5T18		MCE237	MS-32	
C36	.01	400	Q693-19	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C37	10000		K946-2	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C38A	5000									
B	250		♦R963-1	♦PA-112-2	♦PC-71	♦112TM2	♦1406-02		♦T-4	
C										
C39	10000		K946-2	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C40	10000		K946-2	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C41	.047	400	Q693-28	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C42	.047	400	Q693-28	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	

♦ Items C37A, C37B, C37C, R33A and R33B are combined in one unit.
When replacing items individually, items C37B and C37C should total 250MMF.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	NATIONAL PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	10KΩ	2	K349-3		A43-10K		R10,000L	Sensitivity-Wire Wound
B	Shaft		Not Req.		FS-3		DS-36	Attach to R1A
R2A	1500Ω	½	K915-16	Q11-110	A47-2000-S	B-6	U-6	Pitch
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A
R3A	500KΩ	½	K347-1	Q13-133	A47-500K-Z	B-60-S	U-48	Volume
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not Req.	Attach to R3A
C	Switch		Not Req.	76-1	SWE-12	Not Req.	US-26	Attach to R3A
R4A	1000Ω	1	D-831-2	W-1000	A43-1000		R1000L	S. Meter Adj.-Wire Wound
B	Shaft		Not Req.	Not Req.	FKS-1/4		Not Req.	Attach to R4A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	NATIONAL PART No.	IRC PART No.	
R5	470KΩ	½	J569-57	BTS-470K	
R6	68Ω	½	J569-11	BTS-68	
R7	47KΩ	½	J569-45	BTS-47K	
R8	15KΩ	1	J571-39	BTA-15K	
R9	68Ω	½	J569-11	BTS-68	
R10	2200Ω	½	J569-29	BTS-2200	
R11	47KΩ	½	J569-45	BTS-47K	
R12	220Ω	½	J569-17	BTS-220	
R13	33Ω	½	J569-7	BTS-33	
R14	150KΩ	½	J569-51	BTS-150K	
R15	220Ω	½	J569-17	BTS-220	
R16	150Ω	½	J569-15	BTS-150	
R17	15KΩ	1	J571-39	BTA-15K	
R18	22KΩ	½	J569-41	BTS-22K	
R19	270KΩ	½	J569-54	BTS-270K	
R20	1000Ω	½		BTS-1000	Note 1
R21	100KΩ	½	J569-49	BTS-100K	
R22	680Ω	½	J569-23	BTS-680	
R23	100KΩ	½	J569-49	BTS-100K	
R24	2200Ω	½	J569-29	BTS-2200	
R25	2.2Meg	½	J569-65	BTS-2.2Meg	
R26	1Meg	½	J569-61	BTS-1Meg	
R27	1Meg	½	J569-61	BTS-1Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	NATIONAL PART No.	IRC PART No.	
R28	270KΩ	½	J569-54	BTS-270K	
R29	270KΩ	½	J569-54	BTS-270K	
R30	100KΩ	½	J569-49	BTS-100K	
R31	47KΩ	1		BTA-47K	Note 2
R32	10Meg	½	J569-73	BTS-10Meg	
R33A	250KΩ	½	♦R983-1		
B	500KΩ	½			
R34	470KΩ	½	J569-57	BTS-470K	
R35	270Ω	1	J571-18	BTA-270	
R36	1500Ω	½	J569-27	BTS-1500	
R37	22Ω	1	J571-5		
R38	10Meg	½	J569-73	BTS-10Meg	
R39	1Meg	½	J569-61	BTS-1Meg	
R40	2.2Meg	½	J569-65	BTS-2.2Meg	
R41	6800Ω	½	J569-35	BTS-6800	
R42	150KΩ	½	J569-51	BTS-150K	
R43	100KΩ	1	J571-49	BTA-100	
R44	4700Ω	½	J569-33	BTS-4700	
R45	4700Ω	2	J572-33	BTB-4700	
R46	500Ω	10	M707-3	1 3/4A-500	
R47	10Ω	1	J569-1		
R48	10Ω	½	J569-1	BTS-10	

Note 1: Some models may use a 1500Ω resistor in this application.
Note 2: Some models may use a 27KΩ resistor in this application.
Items R33A, R33B, C35A, C35B and C35C are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	NATIONAL PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC @ .6A	610VCT .076ADC	5VAC @ 2A	6.3VAC @ 3A	K316-5	PC-8422① ②	P-3151 ① ②	R-9A① ②	P9312①②	

① Drill new mounting holes.
② Tape 6.3V center tap.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	NATIONAL PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T2	4.6KΩ	3 to 4Ω	K-313-3	A-3877	A-2930	S-3X	Z1004	24S51	

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	NATIONAL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	3.5Ω	.4Ω	SB:1517				Band A-Freq. Range 540 - 1600KC
	Ant. Coil	40Ω	1.2Ω					Band B-Freq. Range 1.6MC - 4.7MC
	Ant. Coil	40Ω	.5Ω					Band C-Freq. Range 4.7MC - 14MC
L2	Ant. Coil	40Ω	.5Ω	SB:1519				Band D-Freq. Range 14MC - 40MC
L3	RF Coil	28Ω	2.8Ω	SB:1518				Band A-Freq. Range 540 - 1600KC
	RF Coil	29Ω	1.8Ω					Band B-Freq. Range 1.6MC - 4.7MC
	RF Coil	29Ω	.1Ω					Band C-Freq. Range 4.7MC - 14MC
L4	RF Coil	0Ω		SB:1520				Band D-Freq. Range 14MC - 40MC
L5	Osc. Coil	1.6Ω	.9Ω	SB:1573-1	14-1073	BC-381	70-Osc.	Band A-Freq. Range 540 - 1600KC
L6	Osc. Coil	1.2Ω	.8Ω	SB:1574-1				Band B-Freq. Range 1.6MC - 4.7MC
L7	Osc. Coil	.2Ω	.1Ω	SB:1575-1				Band C -Freq. Range 4.7MC - 14MC
L8	Osc. Coil	.1Ω	.1Ω	SB:1576-1				Band D-Freq. Range 14MC - 40MC
L9	Input IF	20Ω	20Ω	Q242-2	16-6758*		1483-C	
L10	Crystal Filter Coil	9.5Ω		SB:2641	19-5100		4652	975 Microhenries
L11	Output IF	20Ω	20Ω	Q242-2	16-6758*		1484-C	
L12	Detector Input Coil	20Ω		Q242-1				
L13	BFO Coil	4.2Ω		SB:2642				Tapped at 2.9Ω; Core part no. D166-5.

* Enlarge chassis hole and use adaptor plate.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	NATIONAL PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
L14	.076A	260Ω	8 Hy.	K317-1	C-1709 ①	C-2995 ①	C-8X	C5015 ①	

① Drill one new mounting hole.

MISCELLANEOUS

ITEM No.	PART NAME	NATIONAL PART No.	NOTES
M1	Dial Light	F136-11	#47, Bayonet
M2	Dial Light	F136-11	#47, Bayonet (meter)
M3	Tuning Cap.	P-705-2	Main tuning - 13-454MMF, 13-454MMF, 13-454MMF
M4	Tuning Cap.	P-706-2	Bandspread - 10-37MMF, 10-37MMF, 10-37MMF
M5	Crystal	E-979-1	Filter - Selectivity
M6	Switch	S-245-1	Band
M7	Switch	T-364-1	Reception
M8	Switch	E230-2	Toggle - Receiver - Standby
M9	Switch	E230-2	Toggle - Tone
M10	Switch	T365-1	Selectivity
M11	Crystal Filter Unit	SB2636	Includes phasing trimmer, M10, M5, C18, C19, R18, L10
M12	Meter	T366-1	
A9	Trimmer Cap.	D832.5	RF (2.2-4MMF) Band A
A12	Trimmer Cap.	D832.5	RF (2.2-4MMF) Band B
A15	Trimmer Cap.	D832.5	RF (2.2-4MMF) Band C
A18	Trimmer Cap.	D832.5	RF (2.2-4MMF) Band D
A8	Trimmer Cap.	E311-2	Osc. (5-20MMF) Band A
A11	Trimmer Cap.	E311-2	Osc. (5-20MMF) Band B
A14	Trimmer Cap.	E311-1	Osc. (2.5-6MMF) Band C
A17	Trimmer Cap.	E311-2	Osc. (5-20MMF) Band D
	Trimmer Cap.	S662-1	Ant. & Phasing (5-50MMF) 2 used
	Knob	SA5292-2	Tuning & bandspread
	Knob	SA9305	7 used
	Knob	SB2644	Antenna

OLYMPIC
MODEL 445

OLYMPIC
MODEL 445

TRADE NAME	Olympic Model 445
MANUFACTURER	Olympic Radio & Tel. Corp., 34-01 38th Ave., Long Island City 1, N.Y.
TYPE SET	Three Power Portable AM Superheterodyne Receiver
TUBES (Four)	Types 1R5 Conv., 1U4 IF Amp., 1U5 Det-AVC-AF Amp., 3S4 Output
POWER SUPPLY	105-120 Volts AC-DC (or) 3 Volts "A" Supply & 75 Volts "B" Supply
RATING	.1 Amp. @ 117 Volts AC, (or) 150MA@ 3 Volts DC & 11.5MA@ 75 Volts DC
TUNING RANGE—BROADCAST	540KC - 1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alighment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use battery power, if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1MFD	High side to pin 6 (grid) of 1R5 (V1). Low side to chassis.	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2	"	"	1620KC	"	"	A5	"
3		Loop	1400KC	Tune to 1400KC signal.	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4		"	600KC	Tune to 600KC signal.	"	A7	Rock tuning gang for maximum output. Repeat steps 2, 3 & 4.

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PARTS LIST AND DESCRIPTIONS

OLYMPIC MODEL 445

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		OLYMPIC PART No.	STANDARD REPLACEMENT		
V1	Converter	1R5	1R5	7AT	
V2	IF Amp.	1U4	1U4	6AR	
V3	Det-AVC-AF Amp.	1U5	1U5	6BW	
V4	Output	3S4	3S4	7BA	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	OLYMPIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▪60	150	C03423	AFH3-78		C057		FP309	TVL-3427	
B	▲30	150								
C	100	12								
C2	10000		CCD-103X	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C3	10000		CCD-103X	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C4	.05	200	C0-H-2503	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C5	1000		CCD-102X	BPD-001	DD-102	K069	801-001	DC-521	5HK-D2	
C6A	150		♦PC-2478	♦PA-98	♦PC-51	♦111TM2	♦1403-02		♦D-2	
B	150									
C7	.002	400	C0-H-4202	P488-002	D6-202	CUB4D2	GP2-333-202	PT422	4TM-D2	
C8A	100									
B	5000		*PC-2489	*PA-117	*PC-91	*114TM2	*1407-03		*P-2	
C	5000									
C9	2000		CCD-202X	BPD-002	DD-202	K072	801-002	DC-522	5HK-D2	
C10	.047	400	C0-B-4473	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	

♦ Items C6A, C6B and R6 are combined in one unit.
* Items C8A, C8B, C8C, R10A, R10B and R10C are combined in one unit.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	OLYMPIC PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1Meg	½	PT-876	Q13-137	A47-1Meg-Z	BSK-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-2	SWE-20	Not Req.	US-27	Attach to R1A

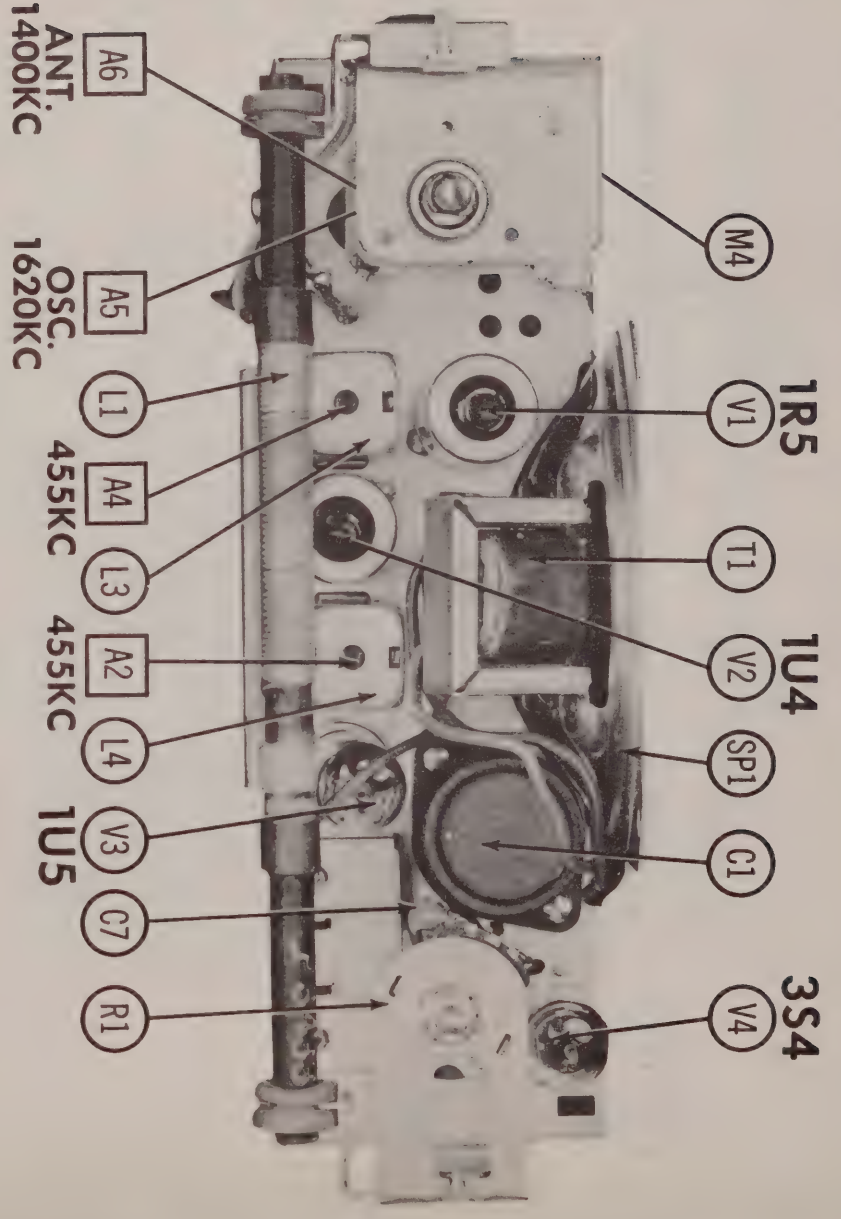
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	OLYMPIC PART No.	IRC PART No.	
R2	100KΩ	½	REB104M	BTS-100K	
R3	4700Ω	½	REB472M	BTS-4700	
R4	10Meg	½	REB106M	BTS-10Meg	
R5	27Ω	½	REB270K	BTS-27	
R6	47KΩ	½	†PC2478	BTS-47K	
R7	4.7Meg	½	REB-475M	BTS-4.7Meg	
R8	10Meg	½	REB106M	BTS-10Meg	
R9	390Ω	½	REB-391K	BTS-390	
R10A	4.7Meg	½	♦PC2489	BTS-4.7Meg	
B	1Meg	½		BTS-1Meg	
C	2.2Meg	½		BTS-2.2Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	OLYMPIC PART No.	IRC PART No.	
R11	1200Ω	½	REB122M	BTS-1200	
R12	680Ω	½	REB681M	BTS-680	
R13	1800Ω	1	REC182K	BTA-1800	
R14	2000Ω	10	RE3429		
R15	150Ω	3	RE3462		
R16	220KΩ	½	REB224M	BTS-220K	

† R6, C6A, C6B are combined in one unit.
♦ R10A, R10B, R10C, C8A, C8B and C8C are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	OLYMPIC PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	7.6KΩ	3.6Ω	SK3429	A-3329	A-2927①	S-8X	Z1110	24S49	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	OLYMPIC PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.6Ω	RF-3472	ST-113 Mod. P4-X	4A07	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	OLYMPIC PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.3Ω		LP-3433				
L2	Osc. Coil	.8Ω	4.3Ω	CL-3427	14-1073		69-Osc.	Tertiary Winding
L3	Input IF	20Ω	20Ω	TR-3373	16-6758	BC-352	12-C1	
L4	Output IF	20Ω	20Ω	TR-3373	16-6758	BC-353	12-C2	
L5	Line Isolation	0Ω						18 turns #22 insulated wire wound on .1MFD cap.

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	OLYMPIC PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	SELETRON PART No.	
M1	.58 Amp.	RF-3472	1263A	RS65	6S65	65	8J1	

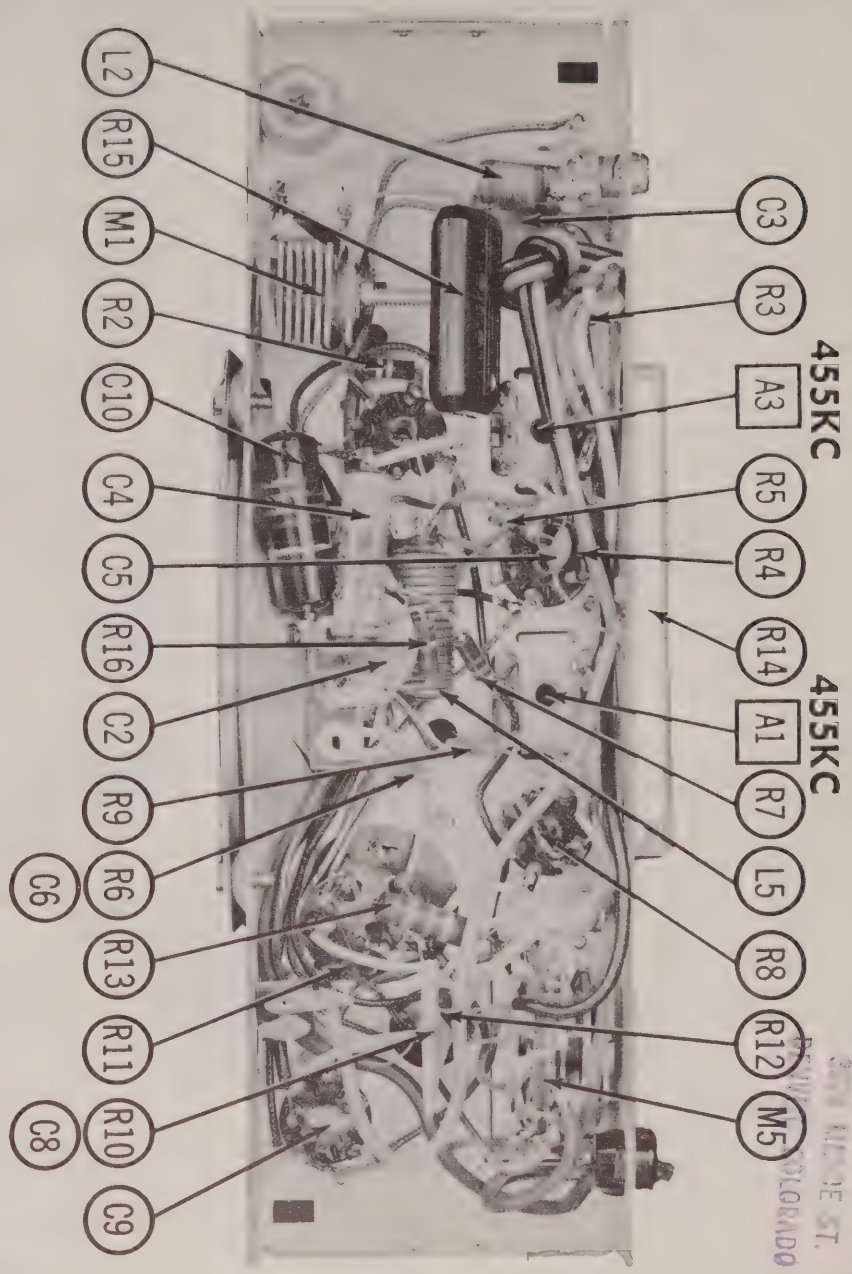
BATTERIES

ITEM No.	VOLTAGE	OLYMPIC PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	1.5V		964			21R			Connect 2 in series
M3	75V			437			XX50		

MISCELLANEOUS

ITEM No.	PART NAME	OLYMPIC PART No.	NOTES
M4	Tuning Cap.	CV-3300	37-485MMF; 29-190MMF;
M5	Switch		Change-over
	Cabinet	CA-3304	Front
	Cabinet	CA-3305	Rear
	Knob	KN-3414	Volume-On-Off
	Knob	KN-3415	Tuning
	Knob	KN-3416	Dial

CHASSIS—BOTTOM VIEW



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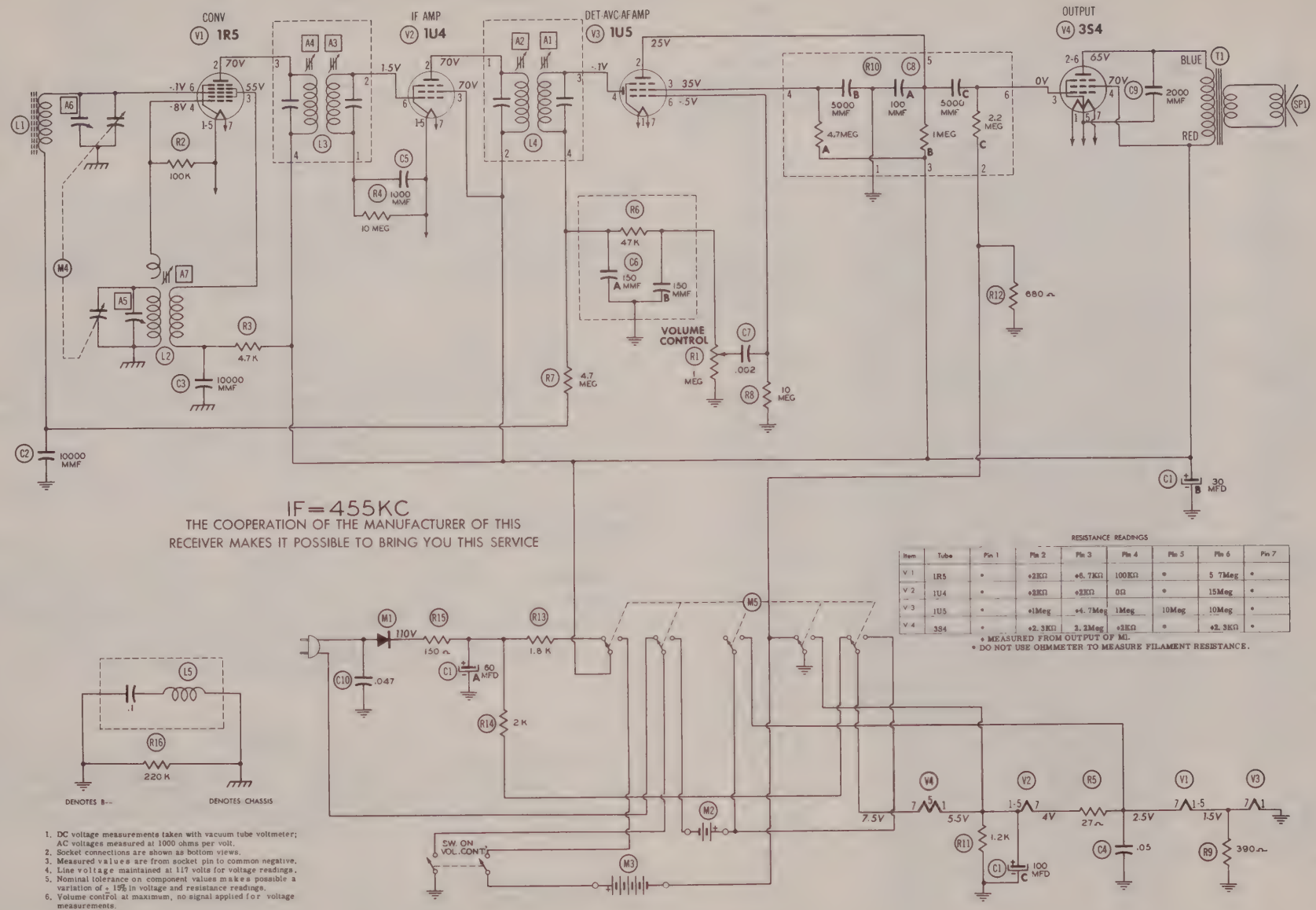
COLORADO



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V-1	1R5	•	•2KΩ	•6.7KΩ	100KΩ	•	5.7Meg	•
V-2	1U4	•	•2KΩ	•2KΩ	0Ω	•	15Meg	•
V-3	1U5	•	•1Meg	•4.7Meg	1Meg	10Meg	10Meg	•
V-4	3S4	•	•2.3KΩ	3.2Meg	•2KΩ	•	•2.3KΩ	•

• MEASURED FROM OUTPUT OF M1.
• DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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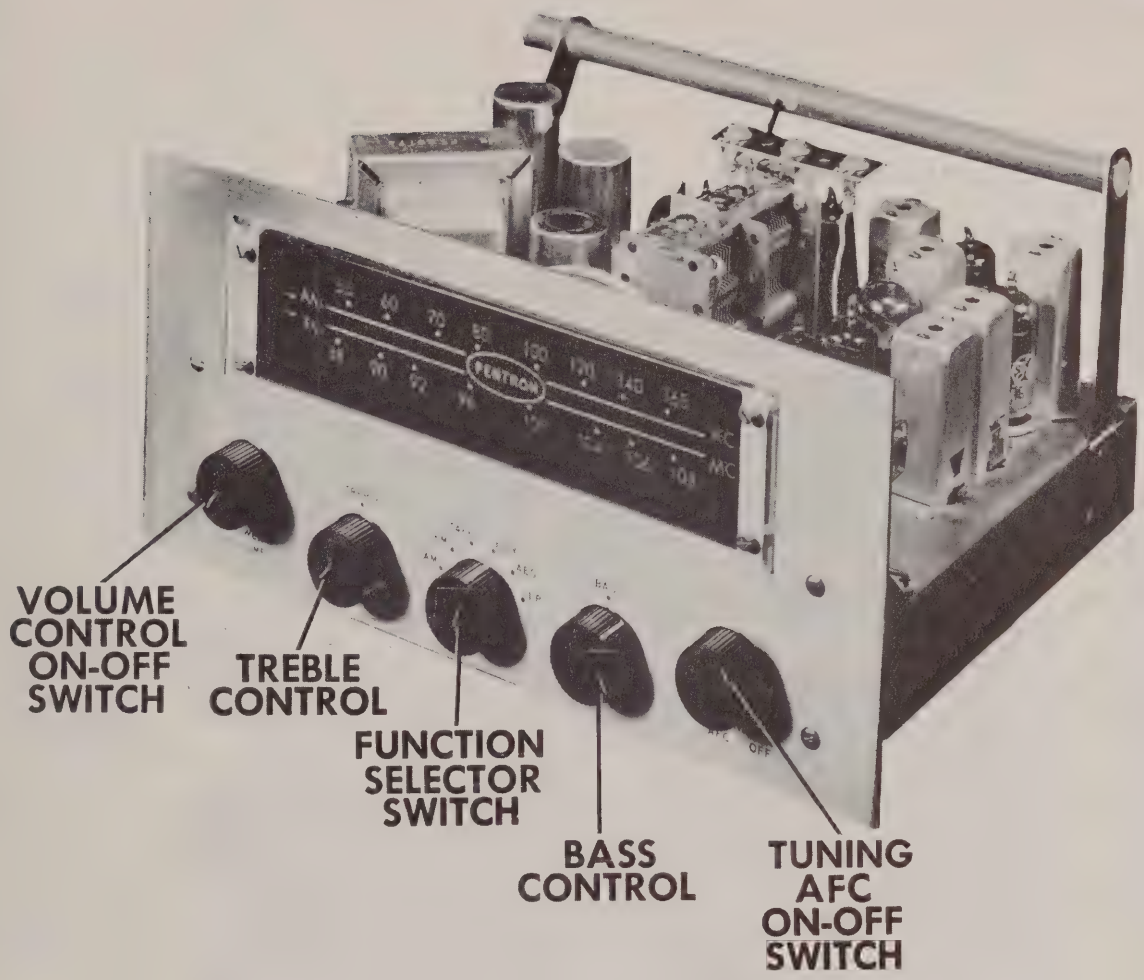
RETMA MEMBER

PENTRON MODEL AFM

PROPERTY OF
L. F. GANNENSHIP
3324 WEAVER ST.
DENVER, COLORADO

PENTRON
MODEL AFM



PENTRON
MODEL AFM

TRADE NAME	Pentron Model AFM		
MANUFACTURER	Pentron Corp., 777 S. Tripp Ave., Chicago 24, Ill.		
TYPE SET	AC Operated AM-FM Superheterodyne Tuner For Custom Installation		
TUBES (Nine)	Types 12AT7 FM RF Amp-Mixer, 12AT7 FM Osc.-AFC, 6BE6 AM Conv., 6BA6 AM FM IF Amp., 6AU6 AM Det-FM Liniter, 6AU6 FM 2nd Limiter, 6AL5 FM Disc., 12AX7 AF Amp.-Cath. Follower, 12AX7 Phono Pre-Amp.		
POWER SUPPLY	110-120 Volts AC	RATING	.24 Amp. @ 117 Volts AC
TUNING RANGE-BROADCAST	535-1700KC	FREQ. MOD.	88-108MC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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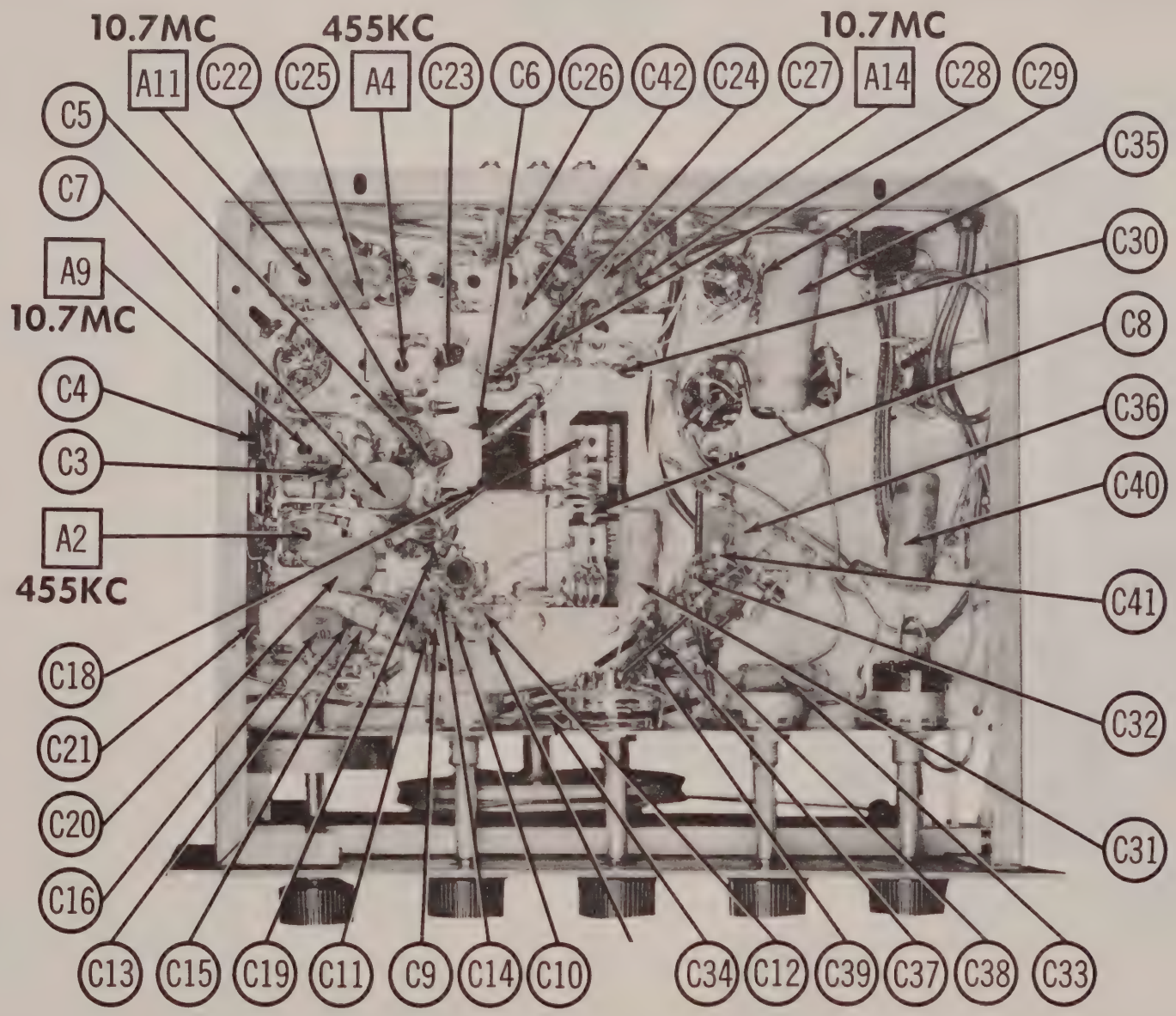
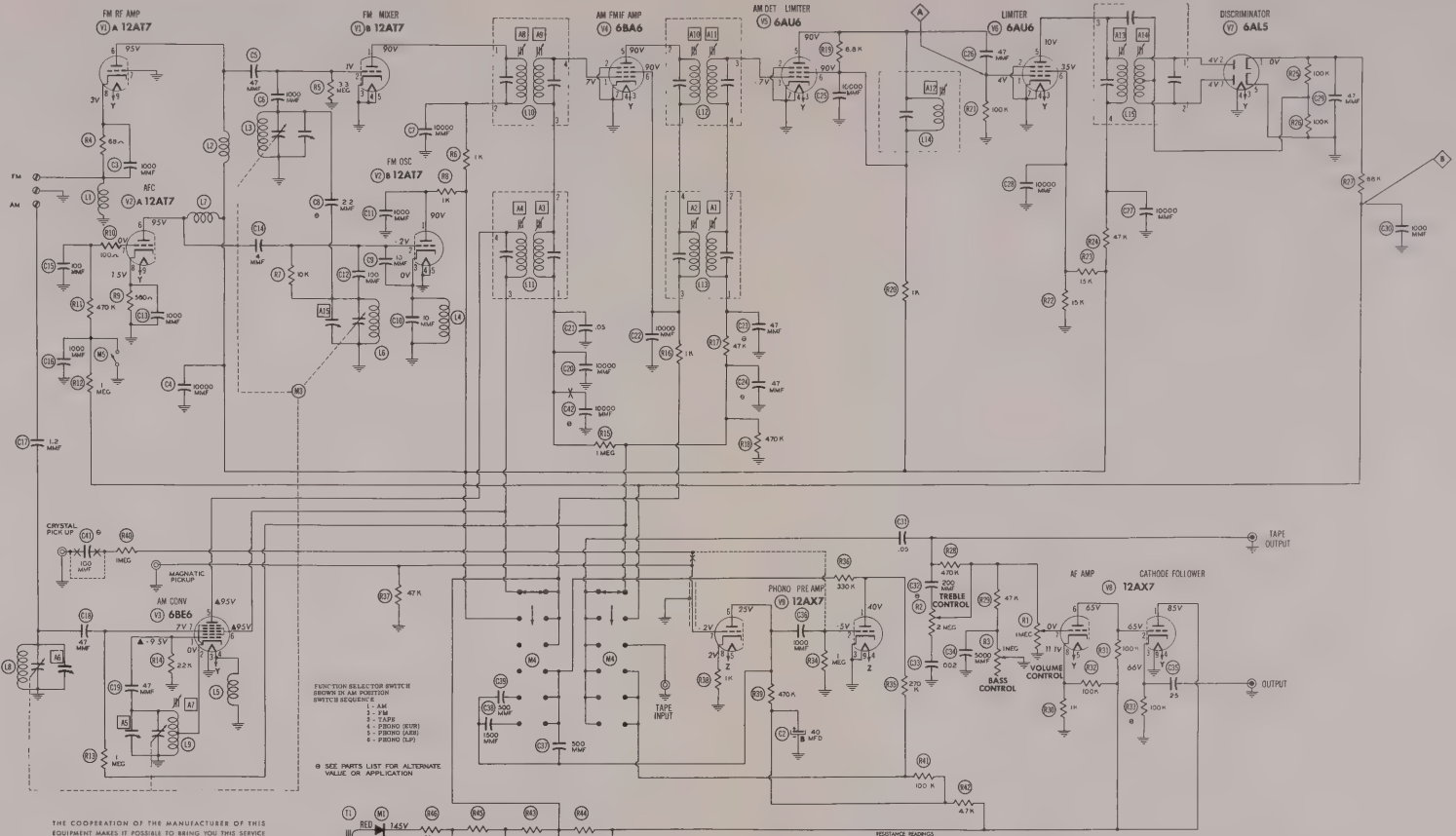


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AT7	†1.7KΩ	3.3Meg	ΩΩ	ΩΩ	ΩΩ	†700Ω	ΩΩ	68Ω	ΩΩ
V2	12AT7	†1.7KΩ	10KΩ	ΩΩ	ΩΩ	ΩΩ	†750Ω	1.7MΩ	68Ω	ΩΩ
V3	6BE6	22KΩ	ΩΩ	ΩΩ	1Ω	1±700Ω	1±700Ω	3.3Meg		
V4	6BA6	1.5Meg	ΩΩ	1Ω	ΩΩ	†700Ω	†700Ω	ΩΩ		
V5	6AU6	510KΩ	ΩΩ	1Ω	ΩΩ	†1.7KΩ	†1.7KΩ	ΩΩ		
V6	6AU6	100KΩ	ΩΩ	1Ω	ΩΩ	†47KΩ	†.5KΩ	ΩΩ		
V7	6AL5	ΩΩ	100KΩ	1Ω	ΩΩ	200KΩ	ΩΩ	100KΩ		
V8	12AX7	†1MΩ	†105Ω	100KΩ	1Ω	1Ω	†105KΩ	80KΩ	1KΩ	ΩΩ
V9	12AX7	†100KΩ	1Meg	ΩΩ	1Ω	1Ω	†480KΩ	47KΩ	1KΩ	ΩΩ

ALL MEASUREMENTS TAKEN IN FM POSITION UNLESS OTHERWISE DESIGNATED
† MEASURED FROM OUTPUT OF M1 SELENIUM RECTIFIER)
▲ MEASURED IN AM POSITION.

1 DC voltage measurements taken with vacuum tube voltmeter
AC voltages measured at 1000 ohms per volt
2 Socket connections are shown as bottom views
3 Measured values are from socket pin to common negative
4 Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements

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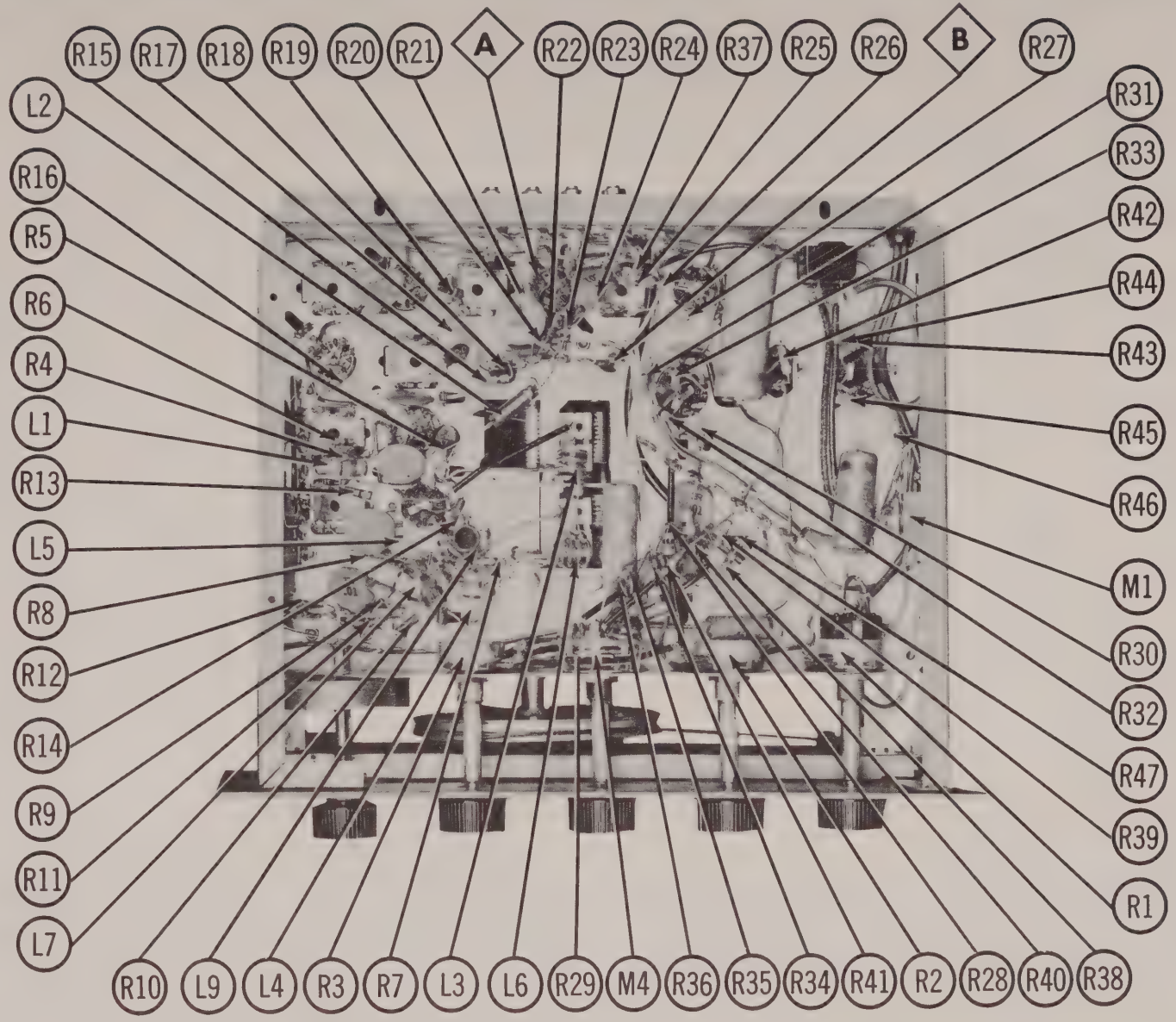


CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

With tuning gang fully closed set dial pointer approximately 1/2 inch to the left of the index mark at "55" on the dial. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.01MFD	High side to pin 7 (grid) of 6BE6 (V3). Low side to chassis.	455KC (400∿ Mod.)	AM	Tuning gang fully open.	Across output jack.	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2	"	High side to "AM" antenna terminal. Low side to chassis.	1500KC	"	1500KC	"	A5, A6	Adjust for maximum deflection.
3	"	"	600KC	"	600KC	"	A7	Adjust for maximum output while rocking tuning gang thru 600KC signal. Repeat steps 2 and 3.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4	.01MFD	High side to pin 7 (grid) of 12AT7 (V1). Low side to chassis.	10.7MC (Unmod.)	FM	Point of non-interference.	DC Probe thru 100KΩ to point Ⓐ. Common to chassis.	A8, A9 A10, A11 A12	Adjust for maximum deflection.
5	"	"	"	"	"	DC probe to point Ⓑ. Common to chassis.	A13	Detune A14 and then adjust A13 for maximum deflection.
6	"	"	"	"	"	"	A14	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4	.01MFD	High side to pin 7 (grid) of 12AT7 (V1). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference.	Vert. amp. thru 100KΩ to point Ⓐ. Low side to chassis.	A8, A9 A10, A11 A12	Adjust for maximum amplitude and symmetry of response similar to Fig. 1.
5	"	"	"	"	"	Vert. amp. to point Ⓑ. Low side to chassis.	A13, A14	Adjust A14 so that 10.7MC occurs at center of cross-over lines as in Fig. 2. Adjust A13 for maximum amplitude and straightness of cross-over lines. Continue alignment with step 7.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7	270Ω carbon resistor	High side thru 270Ω to FM antenna terminal. Low side to chassis.	106MC	FM	106MC	DC probe thru 100KΩ to point Ⓐ. Low side to chassis.	A15	Adjust for maximum deflection.
8	"	"	90MC	"	90MC	"	L6	Compress or expand coil turns for maximum deflection. Repeat step 7.
9	"	"	106MC	"	Tune to 106MC signal.	"	A16	Adjust for maximum deflection.
10	"	"	90MC	"	Tune to 90MC signal.	"	L3	Compress or expand coil turns for maximum deflection. Repeat step 9.

FIG. 1

FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		PENTRON PART No.	STANDARD REPLACEMENT		
V1	FM RF Amplifier - FM Mixer	12AT7	12AT7	9A	
V2	AM Osc.-AFC	12AT7	12AT7	9A	
V3	AM Converter	6BE6	6BE6	7CH	
V4	AM FM IF Amp.	6BA6	6BA6	7BK	
V5	AM Detector - FM Limiter	6AU6	6AU6	7BK	
V6	FM Limiter	6AU6	6AU6	7BK	
V7	Discriminator	6AL5	6AL5	6BT	
V8	AF Amp.-Cathode Follower	12AX7	12AX7	9A	
V9	Phono Pre-Amp.	12AX7	12AX7	9A	

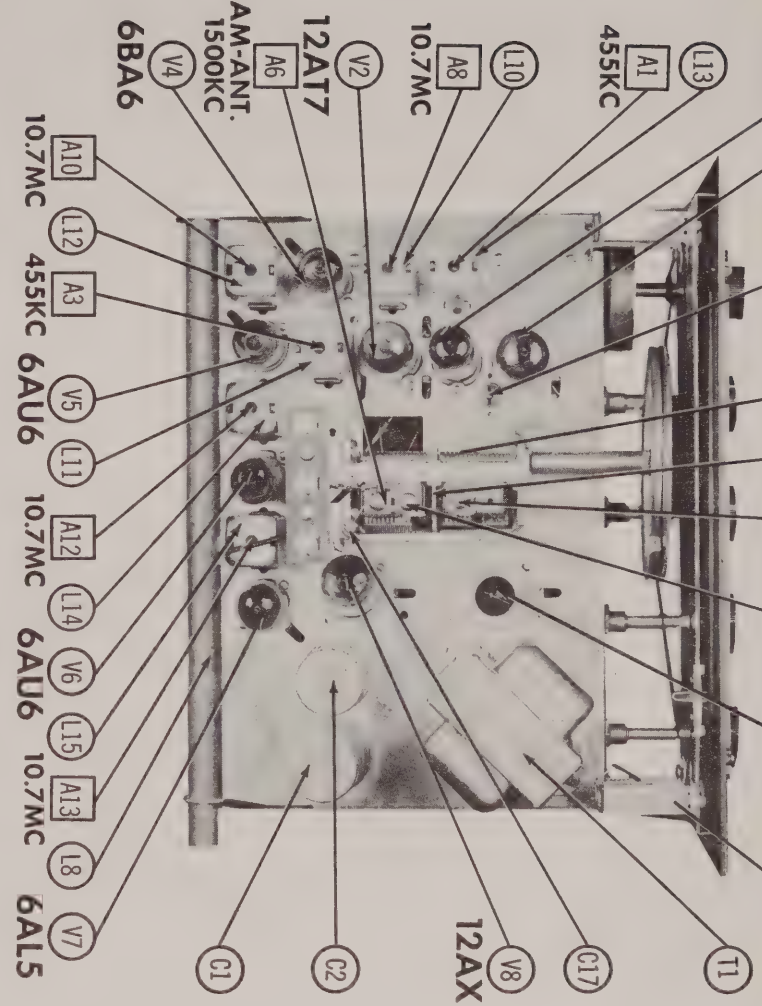
CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	PENTRON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▲40	150		AFH3-10		C009		FP311.5	TVL-3440	
B	40	150								
C	■40	150								
C2A	■40	150		AFH2-14		B014		FP212	TVL-2428	
B	▲40	150								
C3	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C4	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C5	47			BPD-00047	D6-470	G033	GP1K-470	UC-5447	5GA-Q47	
C6	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C7	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C8	2.2			SI2.2NP0	TCZ-2.2	TZ05	NP0K-2R2		5TCCB-V22	Note 1
C9	10			SI10	D6-100	TP09	GP1K-100	UC-541	5GA-Q1	
C10	10			SI10	D6-100	TP09	GP1K-100	UC-541	5GA-Q1	
C11	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C12	100			BPD-0001	D6-101	G042	GP1K-101	UC-531	5GA-T1	
C13	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C14	4									
C15	100			BPD-0001	D6-101	G042	GP1K-101	UC-531	5GA-T1	
C16	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C17	1.2									
C18	47			BPD-00047	D6-470	G033	GP1K- 470	UC-5447	5GA-Q47	
C19	47			BPD-00047	D6-470	G033	GP1K-470	UC-5447	5GA-Q47	
C20	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C21	.05	400		P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C22	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C23	47			BPD-00047	D6-470	G033	GP1K-470	UC-5447	5GA-Q47	Note 2
C24	47			BPD-00047	D6-470	G033	GP1K-470	UC-5447	5GA-Q47	Note 2
C25	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C26	47			BPD-00047	D6-470	G033	GP1K-470	UC-5447	5GA-Q47	
C27	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C28	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C29	47			BPD-00047	D6-470	G033	GP1K-470	UC-5447	5GA-Q47	
C30	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C31	.05	200		P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C32	200			SI200	D6-201	TP38	GP2K-201	UC-532	5GA-T2	Note 3
C33	.002	600		P688-002	D6-202	CUB6D2	GP2-333-202	PT622	6TM-D2	
C34	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C35	.25	200		P288-25		PJ2P25		PT4025	2TM-P25	
C36	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C37	500			SI500	D6-501	TP47	GP2L-501	UC-535	5GA-T5	
C38	1500			SI1500	D6-152	TP54	GP2L-152	UC-5215	5GA-T15	
C39	500			SI500	D6-501	TP47	GP2L-501	UC-535	5GA-T5	
C40	.05	400		489ZX-05	DF-503	PJ4S5		PT415	4TM-S5	
C41	100			SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	Note 4
C42	10000			BPD-01	DD-102	K082	811-01	DC-511	5HK-S1	

Note 1. Some models may use a 1.2 MMF capacitor in this application.
Note 2. Some models may use a 50MMF capacitor in this application.
Note 3. Some models may use a 270MMF capacitor in this application.
Note 4. Not used in all models.

CHASSIS—TOP VIEW



PROPERTY OF
L. F. [illegible]
3921 ELATE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	PENTRON PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1Meg	½	BA012-394	Q13-137	A47-1Meg-Z	BSK-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-12	Not Req.	US-26	Attach to R1A
R2A	2Meg	½	BA011-1314	Q11-139	A47-2Meg-S	AB-75	U-56	Treble
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R2A
R3A	1Meg	½	BA011-1313	Q13-137	A47-1Meg-Z	BSK-70	U-53	Bass
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R3A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PENTRON PART No.	IRC PART No.	
R4	68Ω	½		BTS-68	
R5	3.3Meg	½		BTS-3.3Meg	
R6	1000Ω	½		BTS-1000	
R7	10KΩ	½		BTS-10K	
R8	1000Ω	½		BTS-1000	
R9	560Ω	½		BTS-560	
R10	100Ω	½		BTS-100	
R11	470KΩ	½		BTS-470K	
R12	1Meg	½		BTS-1Meg	
R13	1Meg	½		BTS-1Meg	
R14	22KΩ	½		BTS-22K	
R15	1Meg	½		BTS-1Meg	
R16	1000Ω	½		BTS-1000	
R17	47KΩ	½		BTS-47K	
R18	470KΩ	½		BTS-470K	
R19	6800Ω	½		BTS-6800	
R20	1000Ω	½		BTS-1000	
R21	100KΩ	½		BTS-100K	
R22	15KΩ	½		BTS-15K	
R23	15KΩ	½		BTS-15K	
R24	47KΩ	½		BTS-47K	
R25	100KΩ	½		BTS-100K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PENTRON PART No.	IRC PART No.	
R26	100KΩ	½		BTS-100K	
R27	68KΩ	½		BTS-68K	
R28	470KΩ	½		BTS-470K	
R29	47KΩ	½		BTS-47K	
R30	1000Ω	½		BTS-1000	
R31	100KΩ	½		BTS-100K	
R32	100KΩ	½		BTS-100K	
R33	100KΩ	½		BTS-100K	Note 1
R34	1Meg	½		BTS-1Meg	
R35	270KΩ	½		BTS-270K	
R36	330KΩ	½		BTS-330K	
R37	47KΩ	½		BTS-47K	
R38	1000Ω	½		BTS-1000	
R39	470KΩ	½		BTS-470K	
R40	1Meg	½		BTS-1Meg	
R41	100KΩ	½		BTS-100K	
R42	4700Ω	½		BTS-4700	
R43	330Ω	½		BTS-330	
R44	4700Ω	½		BTS-4700	
R45	330Ω	½		BTS-330	
R46	33Ω	½		BTS-33	
R47	4.7Ω	½			

Note 1. Some models may use a 18KΩ resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	PENTRON PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC Ⓐ.24A	120VAC .024ADC	6.3VAC Ⓐ2.78A				P-3045 ① ②			

① Drill new mounting hole.
② Use old shield.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	PENTRON PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	FM Ant. Coil	.8Ω			19-1000		4602	1 Microhenry (IRC part #CLA)
L2	FM RF Choke	0Ω			19-1001		4604	1.9 Microhenries
L3	FM RF Coil	0Ω						
L4	Cathode Choke	.8Ω			19-1000		4602	1 Microhenry (IRC part #CLA)
L5	Fil. Choke	.8Ω			19-1000		4602	1 Microhenry (IRC part #CLA)
L6	FM Osc. Coil	0Ω						
L7	FM RF Coil	.8Ω			19-1000		4602	1 Microhenry (IRC part #CLA)

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	PENTRON PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L8	AM Ant. Coil	.3Ω						
L9	AM Osc. Coil	3.8Ω			14-1060	BC-381	71-Osc.	Tapped Ⓐ.4Ω
L10	1st. FM IF	.7Ω	.7Ω	1607-1	16-3487	FM-254	1463	
L11	AM Input IF	9Ω	9Ω	1655-12	16-6758	BC-352	12-C1	
L12	2nd. FM IF	.7Ω	.7Ω	1607-5	16-3487	FM-254	1463	
L13	AM Output IF	14Ω	14Ω	1655-6	16-6758	BC-353	12-C2	
L14	3rd. FM IF	.6Ω		EM-115	16-3487 *	FM-254 *	1463 *	
L15	Discriminator	.6Ω	.8Ω CT	2607-1	17-3484 ■	FM-253	1464	

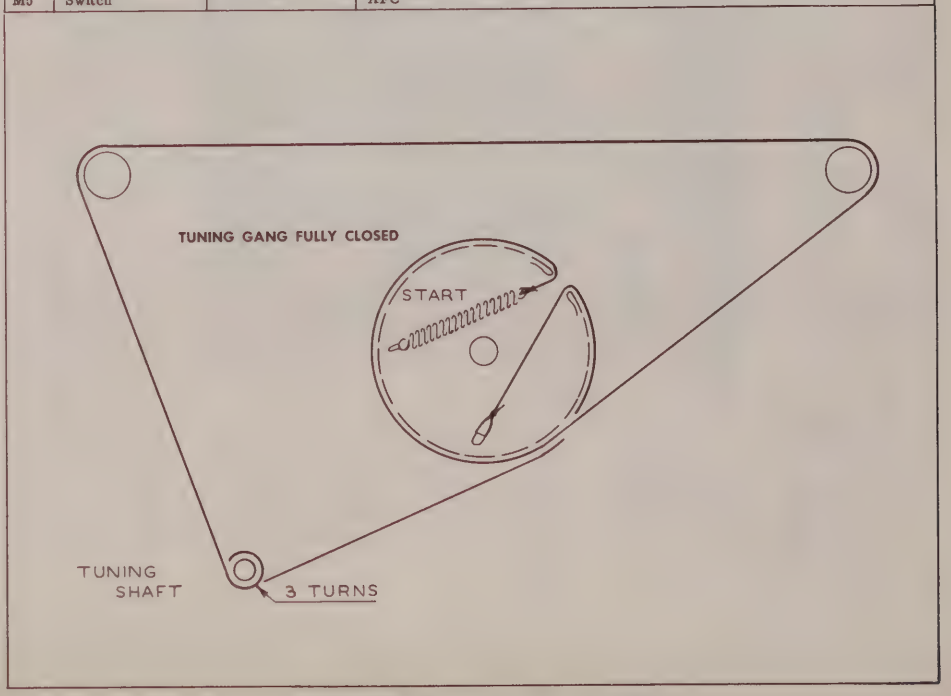
* Use one winding only.
■ Drill mounting holes.

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	PENTRON PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	SELETRON PART No.	
M1	.024A		1263A	RS050	6S65	50	8J1	

MISCELLANEOUS

ITEM No.	PART NAME	PENTRON PART No.	NOTES
M2	Dial Light		#47 Bayonet (2 used)
M3	Tuning Cap.	C20173A	21-547MMF; 21-190MMF
M4	Switch		Selector
M5	Switch		AFC



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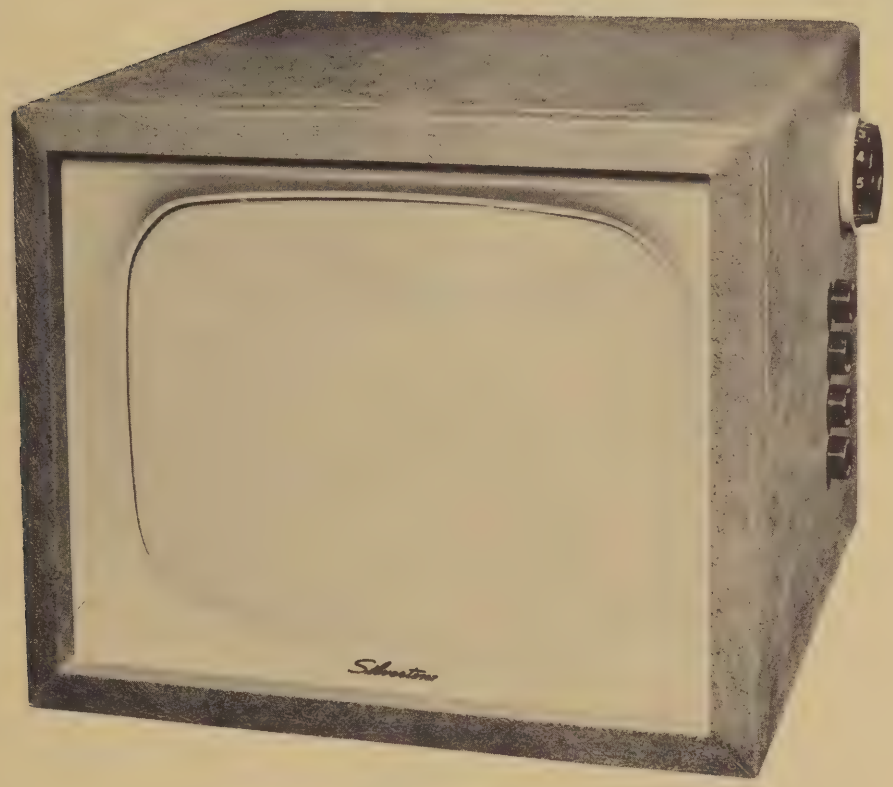

MODEL 5100

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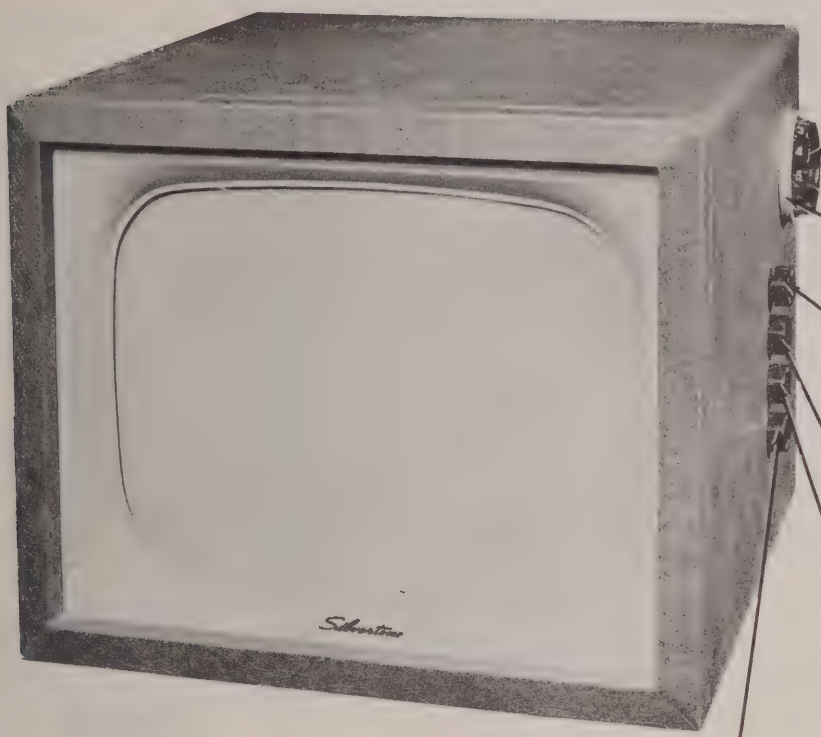

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SILVERTONE MODEL 5100 (Ch. 528.31300)

TRADE NAME	SILVERTONE	MODELS	CHASSIS
		5100	528.31300
		5100	528.31301
		5110, 5126	528.31400
		5110, 5126	528.31401
		5106	528.31700
		5106	528.31701
		5114, 5116, 5128	528.31800
		5130	528.31801
		5126A	528.32800

SUPPLIER Sears Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois
TYPE SET Television Receiver
TUBES Sixteen
POWER SUPPLY 110-120 Volts AC - 60 Cycles RATING 1.18 Amp. @ 117 Volts AC
TUNING RANGE - Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 26.25MC, Sound IF 21.75MC (Intercarrier)

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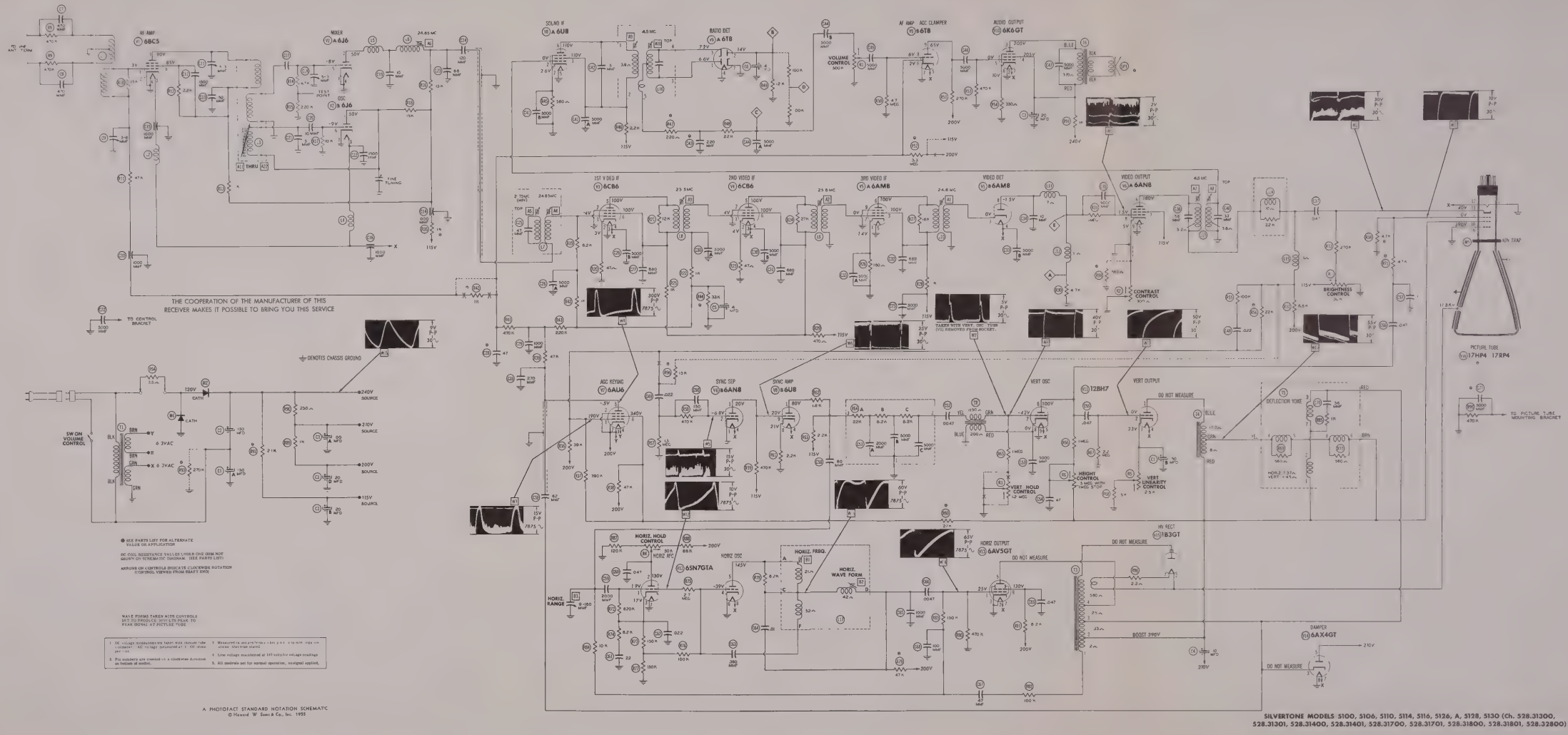
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
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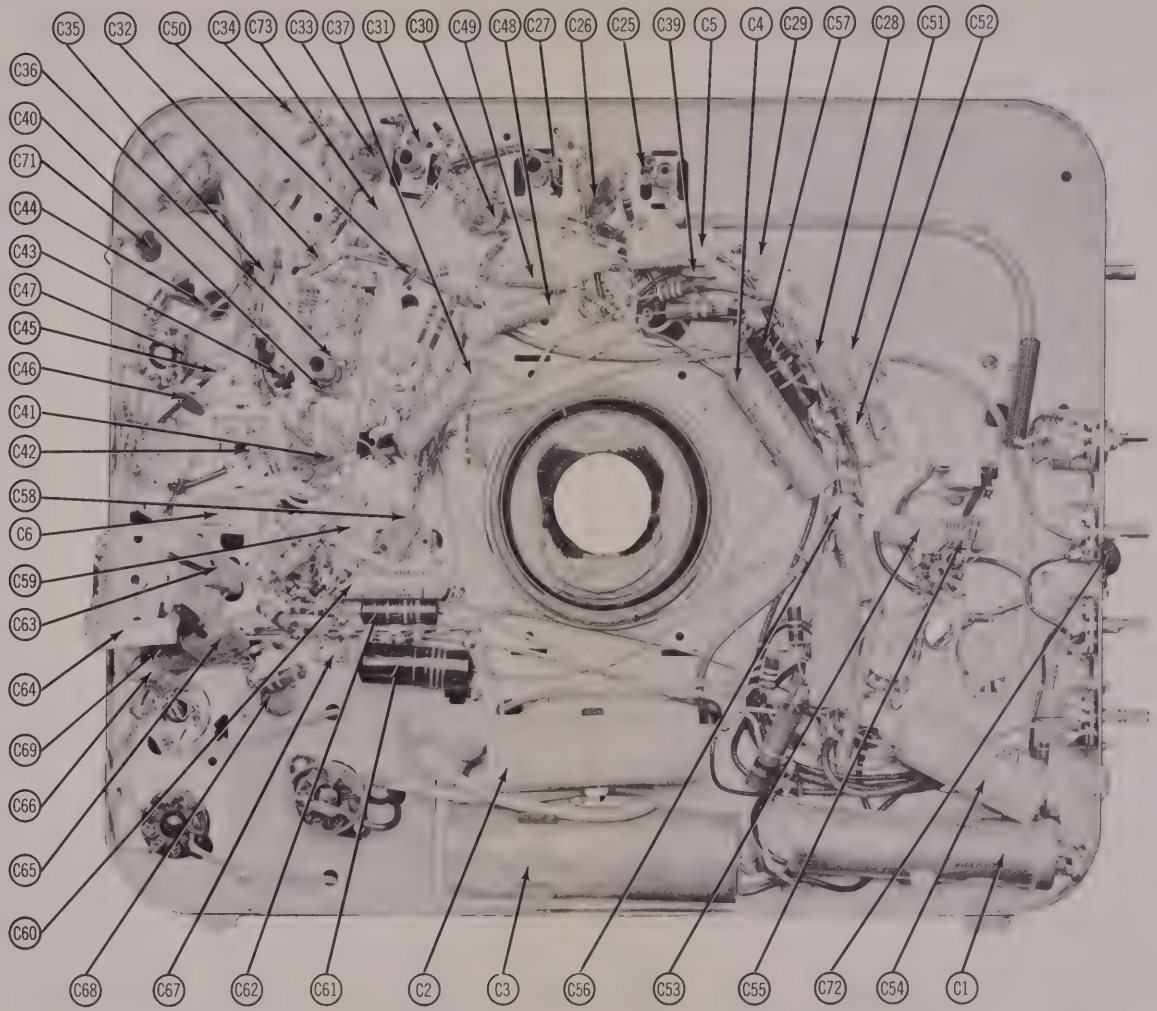
CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

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TUBE PLACEMENT CHART

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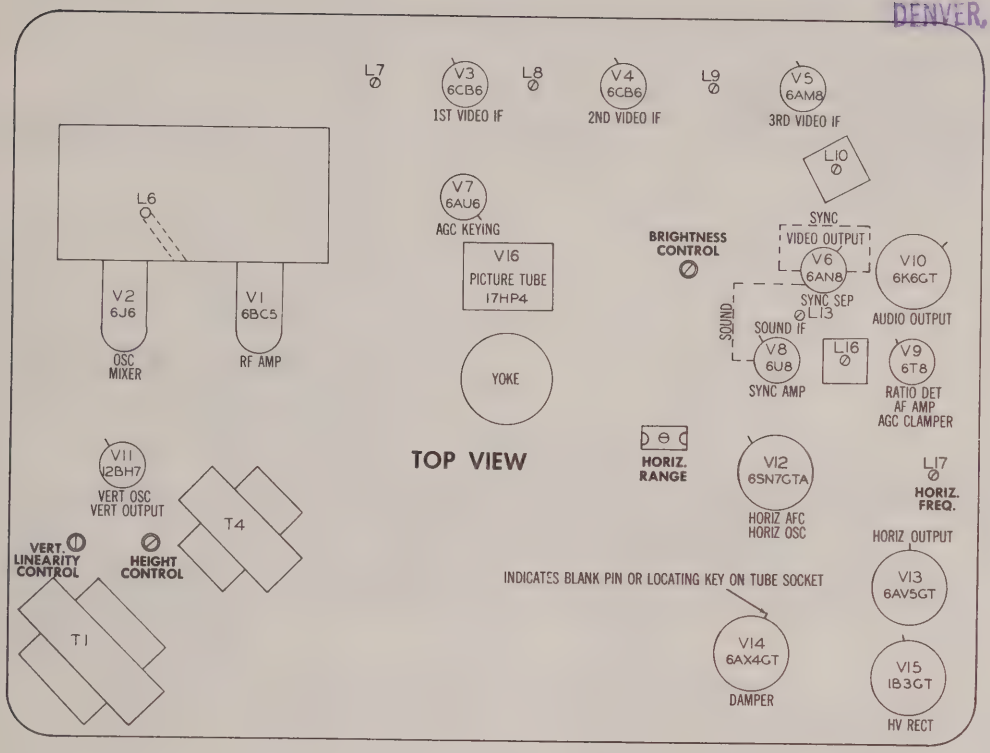


TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - Selenium Rectifiers (M1 & M2)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V6, V7, V16
Has pic, no sound - V8, V9, V10
Overloaded picture - V7, V9

SYNC FAILURE
No vert. sync - V8, V11
No horiz. sync - V8, V12
No vert. or horiz. sync - V6, V8

SWEEP FAILURE
No raster, has sound - V12, V13, V14, V15, V16
No vertical deflection - V11
Poor vert. linearity or foldover - V11
Poor horiz. linearity or foldover - V12, V13, V14
Narrow picture - V12, V13, V14, V15, M1, M2
Vert. off freq. - V8, V11
Horiz. off freq. - V8, V12

SILVERTONE MODELS 5100, 5106, 5110, 5114, 5116, 5126, A, 5128, 5130 (Ch. 528.31300, 528.31301, 528.31400, 528.31401, 528.31700, 528.31701, 528.31800, 528.31801, 528.32800)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use an isolation transformer to protect the test equipment.
The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube (V12) to disable the high voltage.

VIDEO IF ALIGNMENT

Connect the negative lead of a 4.5 volt bias battery to the ungrounded side of C5. Connect the positive side to chassis.
Remove the converter tube (V2) and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24.65MC (Unmod)	Any	DC probe thru 10KΩ to point Ⓐ. Common to chassis.	A1	Attenuate generator output to maintain not more than -2.5 volts at VTVM. Adjust for maximum deflection.
2.	"	"	25.8MC	"	"	A2	"
3.	"	"	23.5MC	"	"	A3	"
4.	"	"	24.65MC	"	"	A4	Adjust A6 fully counter clockwise. Adjust A4 for maximum deflection.
5.	"	"	21.75MC	"	"	A5	Increase generator output and adjust A5 for MINIMUM deflection. Repeat steps 4 and 5.
6.	"	"	24.65MC	"	"	A6	Adjust for maximum deflection. Attenuate generator output to maintain -2.5 volts at VTVM.

OVERALL VIDEO IF RESPONSE CHECK

Attenuate sweep generator output to maintain 2 volts peak to peak on scope (-.3 volt on VTVM). If a separate marker generator is used couple it loosely to sweep output cable near ungrounded converter tube shield.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC Swp)	21.75MC 23.25MC 23.5MC 24.65MC 25.8MC 26.25MC	Any	Vert. Amp. thru 10KΩ to point Ⓐ. Low side to chassis		Check for response curve similar to Fig.1. If necessary, retouch A1 thru A4 and A6 to obtain desired response. Increase sweep generator output and use high scope gain to view 21.75MC marker. If necessary, retouch A5 to place 21.75MC marker in center of trap notch.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point Ⓑ to chassis. The junction of these two resistors is alignment point Ⓓ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.001MFD	High side to point Ⓔ. Low side to chassis.	4.5MC	Any	DC probe to point Ⓑ. Common to chassis.	A7, A8, A9	Adjust for maximum deflection.
9.	"	"	"	"	DC probe to point Ⓒ. Common to point Ⓓ.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	.001MFD	High side to point Ⓔ. Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point Ⓑ. Low side to chassis.	A7, A8, A9	Disconnect stabilizing capacitor C6. Adjust for curve of maximum amplitude and symmetry similar to Fig. 2.
9.	"	"	"	"	"	Vert. Amp. to point Ⓒ. Low side to chassis.	A10	Reconnect stabilizing capacitor C6. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.

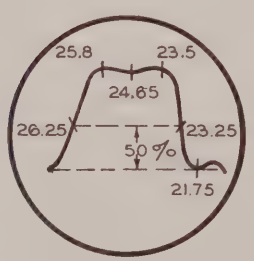


FIG. 1

FIG. 2

ALIGNMENT INSTRUCTIONS (cont)

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
The channel oscillator adjustment screws are reached thru a hole just to the left of the channel switch shaft. The correct adjustment is accessible thru this hole as the channel switch is turned to each channel.
Leave the bias supply connected as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.	A11	Adjust to place sound marker in trap notch as in Fig. 4. Video marker should be at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A12	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A13	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A14	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A15	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A16	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A17	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A18	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A19	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A20	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A21	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A22	

RF AND MIXER ALIGNMENT

The RF and Mixer portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion of the receiver should not be required in the field.

4.5MC TRAP ALIGNMENT

Tune in a local TV station and inspect the picture for evidence of 4.5MC beat interference.
If necessary, adjust A7 until the horizontal scanning lines are smooth and continuous.

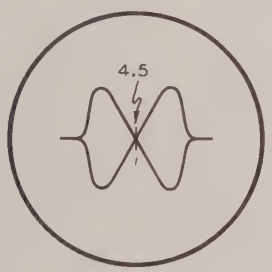


FIG. 3

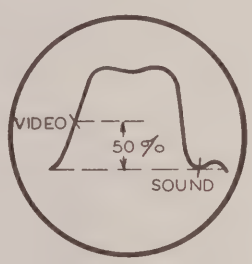


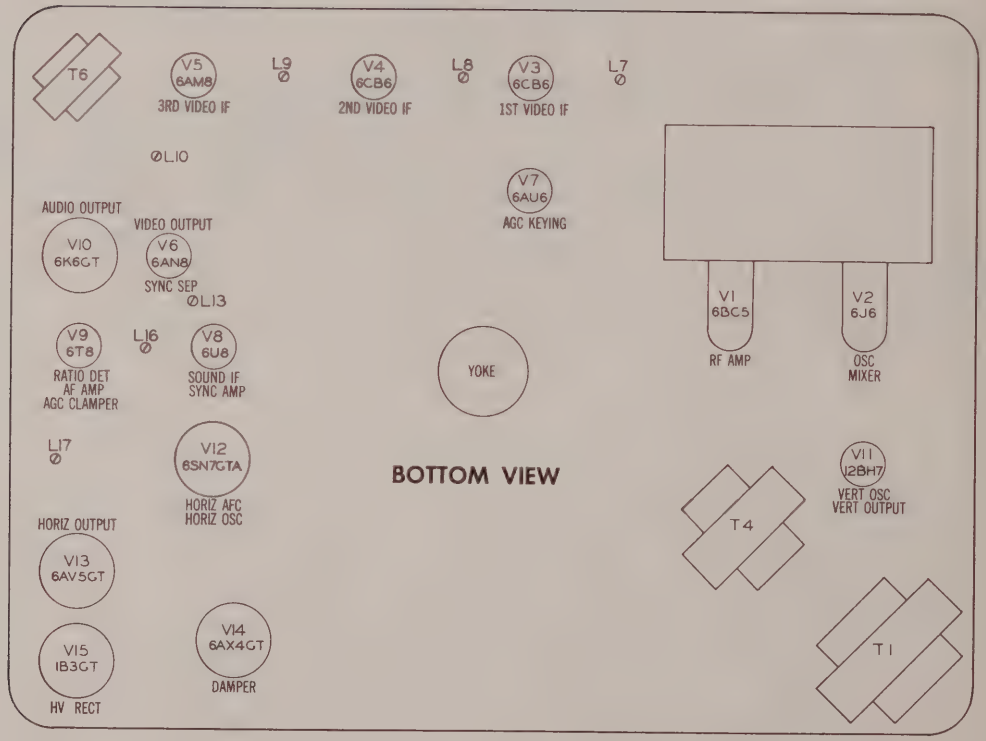
FIG. 4

SILVERTONE MODELS 5100, 5106, 5110, 5114, 5116, 5126, A, 5128, 5130 (Ch. 528.31300, 528.31301, 528.31400, 528.31401, 528.31700, 528.31701, 528.31800, 528.31801, 528.32800)

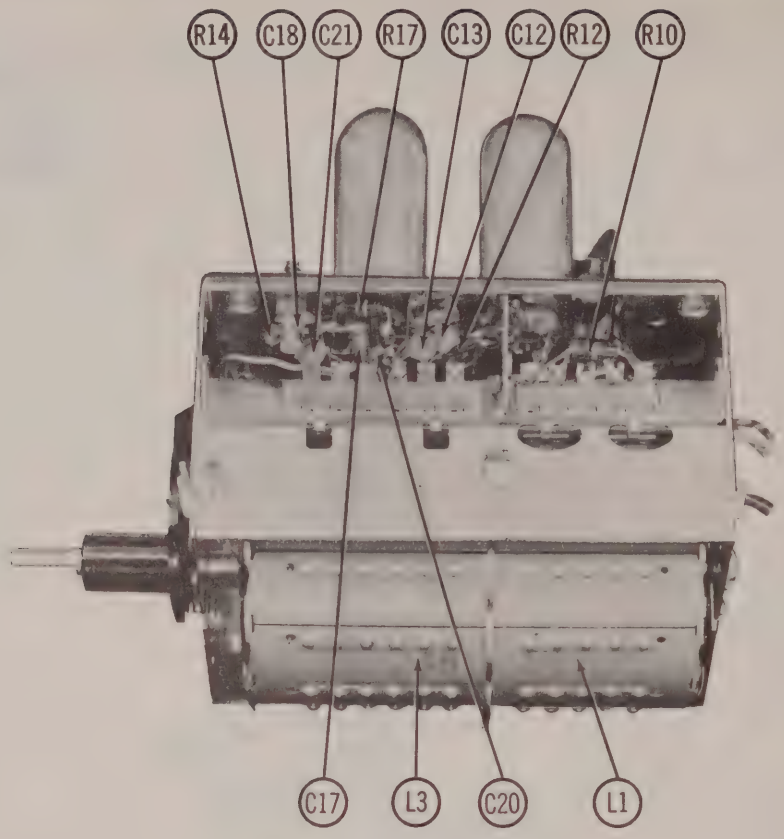
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	700KΩ	0Ω	.1Ω	0Ω	†4.1KΩ	†6.3KΩ	0Ω		
V 2	6J6	†18KΩ	†18KΩ	.1Ω	0Ω	225KΩ	10KΩ	0Ω		
V 3	6CB6	45KΩ	47Ω	0Ω	.1Ω	†3.6KΩ	†3.6KΩ	0Ω		
V 4	6CB6	35KΩ	47Ω	0Ω	.1Ω	†3.6KΩ	†3.6KΩ	0Ω		
V 5	6AM8	180Ω	.3Ω	†3.6KΩ	.1Ω	0Ω	†3.6KΩ	.3Ω	4.7KΩ	0Ω
V 6	6AN8	†470KΩ	2Meg	0Ω	.1Ω	0Ω	†7KΩ	†2.1KΩ	1Meg	100Ω
V 7	6AU6	†20KΩ	†1.3KΩ	†1.3KΩ	†1.3KΩ	350KΩ	▲22KΩ	†1.3KΩ		
V 8	6U8	†6KΩ	3.8Ω	†4.3KΩ	.1Ω	0Ω	†4.3KΩ	560Ω	2.2KΩ	†470KΩ
V 9	6T8	INF	12KΩ	INF	0Ω	.1Ω	700KΩ	0Ω	4.7Meg	†270KΩ
V 10	6K6GT	INF	0Ω	†1.4KΩ	†1KΩ	470KΩ	†1.3KΩ	.1Ω	330Ω	
V 11	12BH7	▲2KΩ	2.2Meg	2.8KΩ	.1Ω	.1Ω	▲2.6Meg	1.4Meg	200Ω	0Ω
V 12	6SN7GTA	1Meg	†70KΩ	300KΩ	250KΩ	†48KΩ	0Ω	0Ω	.1Ω	
V 13	6AU5GT	470KΩ	0Ω	0Ω	INF	▲25Ω	INF	.1Ω	†8.6KΩ	
V 14	6AX4GT	INF	INF	100KΩ	INF	†250Ω	INF	.1Ω	0Ω	
V 15	1B3GT		PINS	1 - 8	HAVE	INF	RESISTANCE			TOP CAP ▲585Ω
V 16	17HP4	0Ω	4.7KΩ	PIN 6 0Ω	PIN 10 ▲20Ω	PIN 11 †300KΩ	PIN 12 .1Ω			

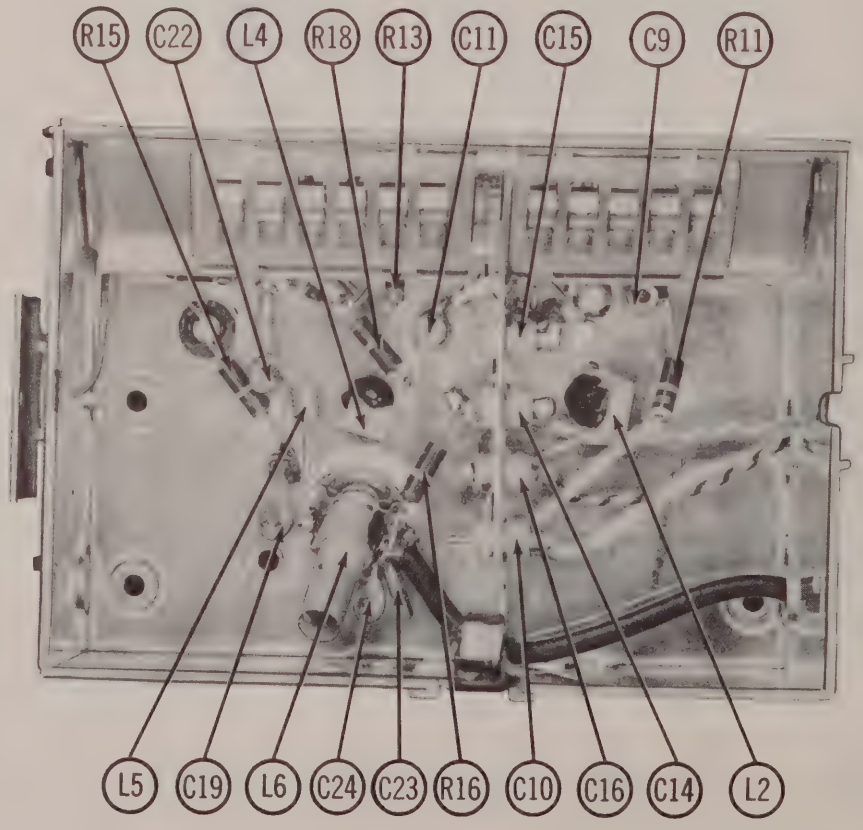
† MEASURED FROM OUTPUT OF M2.
▲ MEASURED FROM PIN 3 OF V14



TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW

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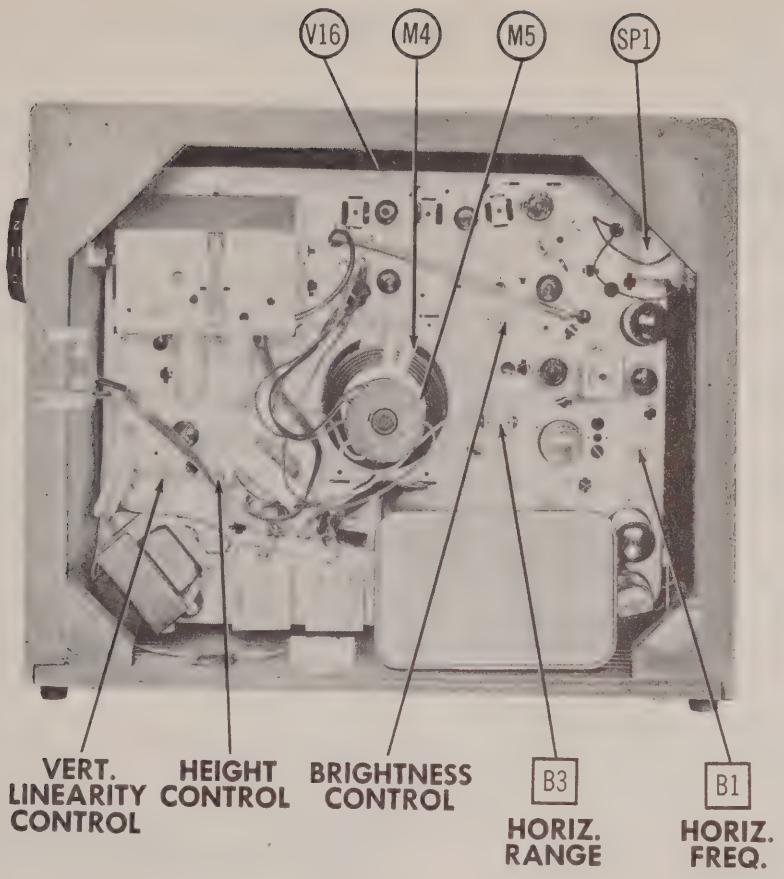


CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

HORIZONTAL FREQUENCY ADJUSTMENT

1. Turn the horizontal range trimmer (B3) maximum clockwise.

2. If the picture cannot be synchronized with the horizontal hold control, set the control to its mid-range position and adjust the horizontal frequency slug (B1) until the picture is in sync. If the picture will not synchronize, turn the horizontal waveform slug (B2) several turns counter clockwise and readjust B1 until the picture synchronizes.

HORIZONTAL WAVEFORM ADJUSTMENT

Connect the vertical amplifier of oscilloscope through a low capacity probe (See Fig. 6) to terminal "C" of L17.

If necessary, adjust B2 for waveform similar to Fig. 5 with broad and narrow peaks of equal height. Keep the picture in sync while making this adjustment with the horizontal hold control or B1. Remove scope.

HORIZONTAL RANGE ADJUSTMENT

1. Turn the horizontal hold control maximum counter clockwise. Switch off channel and then back again. If the picture does not lose sync, turn B1 counter clockwise until picture loses sync when switching off channel and back again. Adjust B1 clockwise until picture just pulls into sync.

2. Turn horizontal hold control maximum clockwise. Switch off channel then back again, If the picture does not pull into sync turn the horizontal range trimmer (B3) clockwise until the picture pulls into sync.

3. Due to reaction between B1 and B3 it may be necessary to repeat steps 1 and 2 several times before proper synchronization is obtained. When properly adjusted, the picture should remain in sync at both extreme settings of the horizontal hold control when switching off channel and back again.

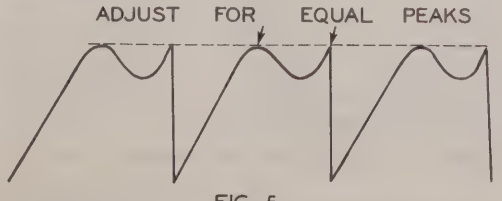


FIG. 5

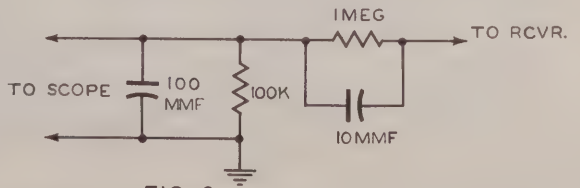


FIG. 6

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V13 and V14. Check R94, R81, C4, C66 and other associated components.

DRIVE LINES

Check by substitution V13 and V14. Check C65, C66, R81 and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V13 and V14. Check horizontal output and damper stages for component failure or change of value.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V12, V13 and V14. Check C62 for open. Check adjustments B1, B2 and B3. Check L17, R78, C63 and other associated components.

XMAS TREE EFFECT

Check by substitution V12, V13 and V14. Check T3 and T5A for internal arcing. Check L17, R78, R79, C63, C64 and other associated components.

VERTICAL

LOSS OF SWEEP

Substitute V11. Check waveform W9.

If Satisfactory	If Unsatisfactory
Check T4, T5B, R5, R68, C1B and other associated components.	Check T2, R6, R66, C54, C55 and other associated components.

INSUFFICIENT SWEEP

Substitute V11. Check height and vertical linearity controls for proper operation. Check T4 and T5B.

COMPRESSED AT BOTTOM

Substitute V11. Check R6, R66, C54, C55 and other associated components.

COMPRESSED AT TOP

Substitute V11. Check R68, R5, C1B, T4 and other associated components.

FOLDS

Substitute V11. Check C54, C53, R68, T4, T5B and other associated components.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V6 and V8. Check C48, C49, C50, R59, R56, R62, R63 and other associated components.

LOSS OF VERTICAL SYNC - HORIZONTAL SYNC SATISFACTORY

Substitute V11. Check waveform W7.

If Satisfactory	If Unsatisfactory
Check T2, R65, R3, C53 and other associated components.	Check vertical integrator network for component failure or change of value. Check IF alignment for overloading.

LOSS OF HORIZONTAL SYNC - VERTICAL SYNC SATISFACTORY

Substitute V12. Check C58, C59, C60, L17, R88, R4, R78 and other associated components.

HORIZONTAL BENDING

Check by substitution V7, V6, V8 and V12. Check horizontal AFC network.

VIDEO

LOSS OF VIDEO

Substitute V6. Check L14, L15, C37, R32 and other associated components.

SOUND BARS (4.5MC BEAT)

Adjust tuner fine tuning for best sound and picture. Check adjustment A7. Check video IF alignment.

POOR CONTRAST

Substitute V6. Check contrast control and picture tube. Check video detector network.

NEGATIVE PICTURE

Substitute V6. Check picture tube. Check video detector network. Check C37, C35, L12 and L11. Check video IF alignment.

SMEAR

Substitute V6. Check L11, L12, L14, L15, C37 and other associated components.

WIDE BLACK BAR ACROSS PICTURE

Check by substitution V1, V3, V4, V5 and V6 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V8, V9 and V10. Check stages V9 and V10 using audio signal generator. Apply audio signal across R1.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF stages for component failure or change of value.	Check C45, C46, C47, R51, R54, T6, speaker and other associated components.

BUZZ

Adjust tuner fine tuning for best sound and picture. Check adjustment A10. If still unsatisfactory, check V9 and audio IF alignment.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

POWER

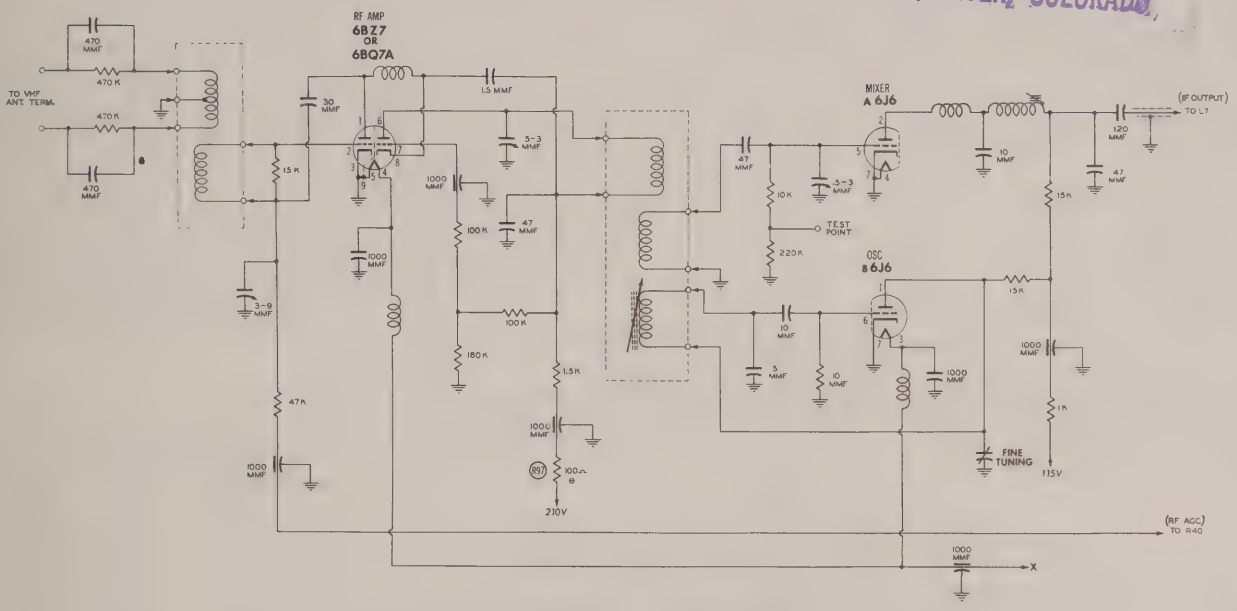
DEAD SET

If filaments fail to light, check AC interlock assembly. Check switch on volume control and T1. If filaments light, check R94, M1 and M2. Check B+ filter and decoupling network.

SMALL AND/OR DIM PICTURE

Check R94, M1 and M2. Check B+ filter and decoupling network.

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



VHF TUNER PART NO. T95-39 USE WITH CHASSIS 528.31700, 528.31701, 528.31800, AND 528.31801

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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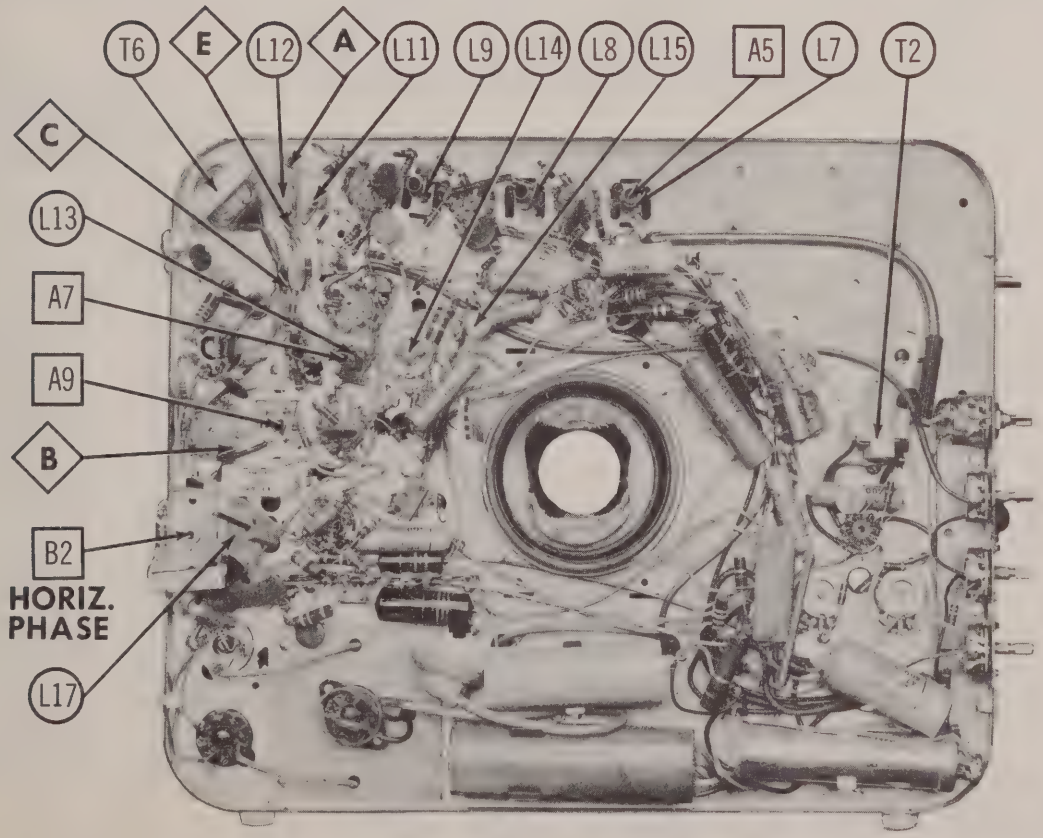
ALTERNATE TUNER SCHEMATIC



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

SILVERTONE MODELS 5100, 5106, 5110, 5114, 5116, 5126, A, 5128, 5130 (Ch. 528.31300, 528.31301, 528.31400, 528.31401, 528.31700, 528.31701, 528.31800, 528.31801, 528.32800)

PROPERTY OF
L. F. BLANKENSHIP
3924 MILAGE ST
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: SILVERTONE PART No.	STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	RF Amp.	6BC8	6BC8	7BD	
V2	Osc.-Mixer	6J6	6J6	7BF	
V3	1st Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd Video IF Amp-Video Det	6AM8	6AM8	9CY	
V6	Video Output-Sync Sep	6AN8	6AN8	9DA	
V7	AGC Keying	6AU8	6AU8	7BK	
V8	Sound IF Amp-Sync Amp.	6U8	6U8	9AE	
V9	Ratio Det-AF Amp-AGC Clamper	6T8	6T8	9E	
V10	Audio Output	6K6GT	6K6GT	7S	
V11	Vert. Osc.-Vert. Output	12BH7	12BH7	8A	
V12	Horiz. AFC-Horiz. Osc.	6SN7GTA	6SN7GTA	8BD	
V13	Horiz. Output	6AV6GT	6AV6GT	8CK	
V14	Damper	6AX4GT	6AX4GT	4CG	
V15	HV Rectifier	1B3GT	1B3GT	3C	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: SILVERTONE PART No.	CBS-HYTRON PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No.	RETMA BASE TYPE	NOTES
V16	17HP4/17RP4	17HP4/17RP4 ① 21KP4 ② 21KP4A	21KP4	17HP4/ 17RP4 21KP4	21KP4	12L 12L 12L	① Aluminized

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	VOLT	REPLACEMENT DATA: SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	≡150	150	1T8-323	AFHJ-24				FP 117	TVL-1430	
B	≡50	25		PR25/50				TC39	TVA-1206	
C2	150	150	1T8-323			CA094				
C3A	100	300	1T8-324						TVA-4580	Red
B	20	300								Yellow
C	20	300								Blue
D	20	300								Green
C4	10	300	1T8-325	PR3350/10		BR1236		TC62	TVA-1804	
C5	4	50	1T8-322	PR3150/4		BR550		TC30	TVA-1303	
C6	4	50	1T8-321	PR3150/4		BR550		TC30	TVA-1303	
C7	470	1000	1T5-297							
C8	470	1000	1T5-297							
C9	.5-8									
C10	1000									
C11	.5-3									
C12	1500			BPD-0015	DD-153	K071	801-0015	DC-5315	5HK-D15	
C13	150			5U150	D5-151	TP57	GP1K-151	UC-5315	5GA-T15	
C14	1000									
C15	1000									
C16	1000									
C17	120			5U120	D5-121	TP55	GP1K-121	UC-5313	5GA-T12	
C18	.5-3									
C19	10			5U10NP0	TC2-10	TZ09	NP0K-100	Z7-541	5TCC-Q1	
C20	10			5U10NP0	TC2-10	TZ09	NP0K-100	Z7-541	5TCC-Q1	
C21	5									
C22	1500			BPD-0015	DD-152	K071	801-0015	DC-5315	5HK-D15	
C23	68			5U120	D5-121	TP55	GP1K-121	UC-5313	5GA-T12	
C24	120			5U47NP0	TC2-47	T232	NP0K-470		5TCC-Q47	
C25	47			BPD-2X005	DD2-502	DK079	832-005	DC-525	5HK-2D5	
C26A	5000		1T5-294					DC-525		Note 7
B	5000							DC-525		
C27	680		1T8-320	5U680	D5-681	TP50	GP2K-681	UC-5368	5GA-T68	
C28	47	200	1T8-340	P268-47		P23P47		PT4047	5TM-P47	Note 1
C29	1000		1T8-320	BPD-001	DD-102	DK069	801-001	DC-581	5HK-D1	
C30A	5000		1T5-294	BPD-2X005	DD2-502	DK079	832-005	DC-525	5HK-2D5	
B	5000							DC-525		
C31	680		1T8-320	5U680	D5-681	TP50	GP2K-681	UC-5368	5GA-T68	
C32	680		1T8-320	5U680	D5-681	TP50	GP2K-681	UC-5368	5GA-T68	
C33A	5000		1T5-294	BPD-2X005	DD2-502	DK079	832-005	DC-525	5HK-2D5	
B	5000							DC-525		
C34	10		1T6-251							
C35	5000		1T6-177	BPD-005	DD-503	K080	801-005	DC-535	5HK-D5	
C36	56									
C37	.047	400	1T6-345	P488-047	DF-503	CUB4847		PT4147	4TM-S47	
C38	82	4000	1T5-287							
C39	270	1000	1T5-289							
C40	33									
C41A	5000		1T6-294	BPD-2X005	DCD-502	DK079	822-005	DC-525	5HK-2D5	
B	5000							DC-525		
C42	5		1T5-223	5U5NP0	TC2-4.7	T207	NP0K-050	Z7-558	5TCUB-V5	
C43	220		1T5-301	5U220	D5-221	TP59	GP2K-221	UC-5322	5GA-T22	Note 2
C44A	5000		1T5-294	BPD-2X005	DCD-502	DK079	832-005	DC-525	5HK-2D5	
B	5000							DC-525		
C45	5000		1T6-177	BPD-005	DD-503	K080	801-005	DC-535	5HK-D5	
C46	5000		1T6-177	BPD-005	DD-503	K080	801-005	DC-535	5HK-D5	
C47	5000		1T6-177	BPD-005	DD-502	K080	801-005	DC-535	5HK-D5	
C48	.022	400	1T6-348							
C49	.022	400	1T6-348							
C50	150		1T5-295							
C51A	2000									
B	5000		≠T17-109	≠PA-110	≠PC-100	≠1U5TM1	≠1405-01	DC-525	≠V-1	
C	5000							DC-525		
C52	.0047	500	1T6-320	P688-0047	D6-476	CUB6D47	GP2-333-472	PT6347	6TM-D47	
C53	5000		1T6-340	BPD-005	DD-502	K080	801-005	DC-535	5HK-D5	
C54	.47	600	1T8-349	P688-47		CUB6P47		PT6P47	6TM-P47	
C55	.047	400	1T6-345	P488-047	DF-503	CUB4847		PT4147	4TM-S47	

CAPACITORS (cont)

ITEM No.	RATING: CAP.	VOLT	REPLACEMENT DATA: SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C56	.047	400	1T6-345	P488-047	DF-503	CUB4847		PT4147	4TM-S47	
C57	.1	400	1T6-346	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C58	180	500	1T8-306			32S1T18				
C59	2000		1T5-228	BPD-002	DD-302	K072	801-002	DC-523	5HK-D2	
C60	.047	400	1T6-345	P488-047	DF-503	CUB4847		PT4147	4TM-S47	
C61	.22	200	1T6-353	P288-22		P22P22		PT4022	2TM-P22	
C62	.022	200	1T6-283	P288-022		P22S22		PT4122	2TM-S22	
C63	390	500	1T5-273	1468-0G4		GB1738		MC6243	MS-34	
C64	.01	600	1T6-382	P688-01	D6-103	CUB6S1	GP2-333-103	PT6S1	6TM-S1	
C65	1000	500	1T5-288	1468-001		1R5D1		MC6201	MS-31	
C66	.0047	600	1T6-382	P688-0G6	D6-502	CUB6D6	GP2-333-502	PT6D5	6TM-D6	
C67	47	500	1T5-299			22R5Q47				
C68	100		1T8-323	KH00	D6-101	TP54	GP1K-101	UC-531	5GA-T1	
C69	.047	400	1T6-345	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C70	56	2000					3KV-560		20GA-Q56	
C71	5000		T16-177	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	Note 3
C72	5000		T16-177	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C73	5000		T16-177	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	

Note 1: Chassis 528.31701, 528.31801 use 1MFD in this application (part #T15-287).
Note 2. Chassis 528.31401, 528.31701, 528.3180., 528.32800 use 560MMF in this application.
Note 3. Chassis 528.31401, 528.31700 and 528.31800 use 2000MMF in this application (part #T15-182).
≠ Items C51A, C51B, C51C, R64A, R64B, R64C are combined in one unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	A34-221	Q1S-133	A47-500K-2	BSK-60-S	U-46	Volume
B	8 Shaft		Not Req.	Not Req.	528-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-13	Not Req.	UB-26	Attach to R1A
R2A	300Ω	½	A25-41	Q1I-103	A47-500-8	AB-3		Contrast
B	Shaft		Not Req.	Not Req.	528-3	AK-4		Attach to R2A
R3A	1.2Meg	½	A25-44	Q1I-138	A47-1.5Meg-8	AB-69	U-155	Vertical Hold
B	Shaft		Not Req.	Not Req.	528-3	AK-6	Not Req.	Attach to R3A
R4A	2Meg	½	A25-42	Q1I-133	A47-.5OK-8	AB-51	U-35	Horiz. Hold
B	Shaft		Not Req.	Not Req.	528-3	AK-4	Not Req.	Attach to R4A
R5A	2500Ω	½	A25-46	Q1I-113	A47-2500-8	AB-7	BU-8	Vert. Linearity
B	Shaft		Not Req.	RQ	FKB-1/4	AK-1	Not Req.	Attach to R5A
R6A	5Meg with 1Meg stop	½	A25-43	Q1I-141	A47-4Meg-8	AB-85	BU-67	Height - Note
B	Shaft		Not Req.	RQ	FKB-1/4	AK-1	Not Req.	Attach to R6A
R7A	100KΩ	½	A25-40	Q1I-128	A47-100K-8	AB-40	BU-41	Brightness
B	Shaft		Not Req.	RQ	FKB-1/4	AK-1	Not Req.	Attach to R7A

Note: Connect a 1Meg resistor in series with the left hand terminal of the control to the lead connecting to the same terminal of the original control. (Control viewed from shaft end, terminals down.)

RESISTORS

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	NOTES
R8	470KΩ	½	T60-4740K	BTS-470K	
R9	470KΩ	½	T60-4740K	BTS-470K	
R10	15KΩ	½		BTS-15K	
R11	47KΩ	½		BTS-47K	
R12	2200Ω	½		BTS-2200	
R13	1000Ω	½		BTS-1000	
R14	4700Ω	½		BTS-4700	
R15	2200KΩ	½		BTS-2200K	
R16	15KΩ	½		BTS-15K	
R17	10KΩ	½	T60-10K	BTS-10K	
R18	15KΩ	½	T60-15K	BTS-15K	
R19	8200Ω	½	T60-8200K	BTS-8200	
R20	47Ω	½	T60-4700K	BTS-47	
R21	12KΩ	½	T60-1230K	BTS-12K	
R22	1000Ω	½	T60-1020K	BTS-1000	
R23	470Ω	½	T60-4700K	BTS-47	
R24	27KΩ	½	T60-2730K	BTS-27K	
R25	1000Ω	½	T60-1020K	BTS-1000	
R26	180Ω	½	T60-1800K	BTS-180	
R27	18KΩ	½	T60-1830K	BTS-18K	
R28	1000Ω	½	T60-1020K	BTS-1000	
R29	470Ω	½	T60-4710K	BTS-470	
R30	4700Ω	½	T60-4720K	BTS-4700	
R31	1Meg	½	T60-1050K	BTS-1Meg	
R32	6800Ω	2	T60-6822K	BTB-6800	
R33	270KΩ	½	T60-2740K	BTS-270K	
R34	4700Ω	2	T60-4702K	BTB-4700	Note 1
R35	1000Ω	½	T60-1020K	BTS-1000	Note 2
R36	33KΩ	½	T60-3330K	BTS-33K	
R37	390KΩ	½	T60-3940K	BTS-390K	
R38	47KΩ	½	T60-4730K	BTS-47K	
R39	470Ω	½	T60-4731K	BTS-470	Note 4
R40	1000Ω	½	T60-1020K	BTS-1000	Note 3
R41	470KΩ	½	T60-4741K	BTS-470K	
R42	1000Ω	½	T60-1020K	BTS-1000	
R43	220KΩ	½	T60-3240K	BTS-220K	
R44	33KΩ	½	T60-3330K	BTS-33K	Note 4
R45	560Ω	½	T60-5610K	BTS-560	
R46	2200Ω	½	T60-2320K	BTS-2200	
R47	22KΩ	½	T60-2310K	BTS-220	Note 5
R48	22KΩ	½	T60-2230K	BTS-22K	
R49	12KΩ	½	T60-1230K	BTS-12K	
R50	4.7Meg	½	T60-4750K	BTS-4.7Meg	

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	NOTES
R51	270KΩ	½	T60-2740K	BTS-270K	
R52	3.3Meg	½	T60-3350K	BTS-3.3Meg	Note 6
R53	470KΩ	½	T60-4740K	BTS-470K	
R54	330Ω	1	T60-331K	BTA-330	
R55	100KΩ	½	T60-1040K	BTS-100K	
R56	33KΩ	½	T60-3330K	BTS-33K	Note 4
R57	1.5Meg	½	T60-1550K	BTS-1.5Meg	
R58	470KΩ	½	T60-4740K	BTS-470K	
R59	470KΩ	½	T60-4740K	BTS-470K	
R60	22KΩ	1	T60-233K	BTA-22K	Note 7
R61	330Ω	1	T60-331K	BTA-330	
R62	1800Ω	½	T60-1820K	BTS-1800	
R63	2200Ω	½	T60-2320K	BTS-2200	
R64A	22KΩ	2		BTB-22K	
B	2200Ω	½	≠T17-109	BTS-2200	
C	330Ω	1		BTA-330	
R65	1Meg	½	T60-1050K	BTS-1Meg	
R66	1Meg	½	T60-1050K	BTS-1Meg	
R67	3.3Meg	½	T60-3350K	BTS-3.3Meg	
R68	1500Ω	½	T60-1520K	BTS-1500	
R69	56KΩ	½		BTS-56K	
R70	560Ω	½		BTS-560	
R71	470Ω	½	T60-4720K	BTS-4700	Note 8
R72	820KΩ	½	T60-8260K	BTS-820K	
R73	150KΩ	½	T60-1541K	BTA-150K	
R74	820Ω	½	T60-8230K	BTS-820	
R75	2.7Meg 5%	½	T60-2752K	BTS-2.7Meg 5%	
R76	100KΩ	½	T60-1041K	BTA-100K	
R77	150KΩ	1	T60-1541K	BTA-150K	
R78	820Ω	1	T60-8220K	BTA-2200	
R79	470KΩ	1	T60-4731K	BTA-47K	
R80	470KΩ	1	T60-4740K	BTA-470K	
R81	820Ω	2	T60-8232K	BTB-820Ω	
R83	100KΩ	½	T60-1040K	BTS-100K	
R83	150KΩ	½	T60-1540K	BTS-150K	
R84	10KΩ	½	T60-1030K	BTS-10K	
R85	1000Ω	½		BTS-1000	
R86	2.2Ω	½	T60-		
R87	120KΩ	½	T60-1240K	BTS-120K	
R88	68KΩ	1	T60-683K	BTA-68K	
R89	100Ω	1	T60-1031K	BTA-1000	
R90	250Ω	10			

RESISTORS (cont)

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	NOTES
R91	1000Ω	2	T60-1022K	BTB-1000	
R92	2100Ω	15			Note 9
R93	370KΩ	½	T60-3740K	BTS-270K	Note 10
R94	7.5Ω	6	T43-1007		

≠ Items R64A, R64B, R64C, C51A, C51B, C51C are combined in one unit.
Note 1: Chassis 528.31400 may use a 2700Ω resistor in this application.
Note 2: Chassis 528.31701, 528.31801 may use a 1000 resistor in this application.
Note 3: This resistor may not be used in chassis 528.31501, 528.32800, 528.31401, 528.31801 and 528.31701.
Note 4: Chassis 528.31301, 528.31401, 528.31701, 528.31801 and 528.32800 may use a 39KΩ resistor in this application.
Note 5: Chassis 528.31401, 528.31701, 528.31801 and 528.32800 may use a 220KΩ resistor in this application.
Note 6: Some versions may use a 3.9Meg, 3.3Meg, 2.2Meg or a 2Meg resistor in this application.
When R52 is a 2.2Meg or a 2Meg resistor, it is connected to the 115 volt point.
Note 7: Chassis 528.31401, 528.31701, 528.31801 and 528.32800 may use a 22KΩ resistor 2 watt in this application.
Note 8: Chassis 528.31400 may use a 3700Ω resistor in this application.
Note 9: Chassis 528.31701 and 528.31801 may use a 3500Ω resistor in this application.
Note 10 Not used in all versions.
Note 11: This resistor may not be used in chassis 528.31300, 528.31400, 528.31700 and 528.31800.
Note 12: This resistor used only in chassis having VHF tuner part no. T95-39.
Note 13: This resistor is used in chassis 528.31701 and 528.31801 only.

TRANSFORMER (FILAMENT)

ITEM No.	RATING: PRI	SEC 1	SEC 2	REPLACEMENT DATA: SILVERTONE PART No.	Stancor PART No	Merit PART No	Triad PART No	RCA TYPE No	Hallderson PART No	Thordarson PART No
T1	117VAC	6.3VAC ② 3A	6.3VAC ③ 7.5A	T60-318						

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: SILVERTONE PART No	Stancor PART No	Merit PART No	Triad PART No	RCA TYPE No	Hallderson PART No	Thordarson PART No
T2	Vert. Osc. Trans.	T80-317	A-6125 ①	A-3003 ①	A-97X ①	209Z1 ①	B6702 ①	24A87 ①
T3	Horiz. Output Trans.	T80-320	A-6233 *2	HVO-9 *2	D-10 * 2	230T1 *2	FB41 *2	F1-T-14*2
T4	Vert. Output Trans.	T80-316	A-8141 ①	A-3035 ①	A-104X ①	226T1 ①	Z1806 ①	29S54 ①
T5A	Yoke-Horiz. (23MB)	T10-673 ③	DY-11A ③	MDF-75 ③	Y-19-1 ③	223Z4 ③	DF605 ③	Y-10 ③
B	Vert. (23MB)							

① Drill one new mounting hole.
② Drill two mounting holes.
③ Includes rear cover and positioning device.
④ Use original rear cover and positioning device.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Stancor Replacement Connections	Merit Replacement Connections	Triad Replacement Connections	RCA Replacement Connections	Hallderson Replacement Connections	Thordarson Replacement Connections
4	7	9	9	9	9	9
3	6	8	8 & 7	8	8	8 & 7
2	4	3	3	3	3	3
1	3	1	1	1	1	1

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI	SEC	REPLACEMENT DATA: SILVERTONE PART No	Stancor PART No	Merit PART No	Triad PART No	Hallderson PART No	Thordarson PART No	NOTES
T6	5.8KΩ	3.2Ω	T80-319	A-3878 ①	A-3026	S-6X	Z1000 ①	22S47 ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS: SIZE	FIELD	V C IMP	REPLACEMENT DATA: SILVERTONE PART No	JENSEN PART No	QUAM PART No	NOTES
SP1	4"	PM	3.2Ω	T79-429	ST-113 Mod. P4-X	4A1	① Used in models 5114, 5116, 5106, 5130, 5136 and 5126A.
	5"	PM	3.2Ω	T79-430 ①	ST-105 Mod. P5-X	5A1	② Used in models 5128, 5130
	6"	PM	3.2Ω	T79-432 ②	ST-108 Mod. P6-X	6A1	

SILVERTONE MODELS 5100, 5106, 5110, 5114, 5116, 5126, A, 5128, 5130 (Ch. 528.31300, 528.31301, 528.31400, 528.31401, 528.31700, 528.31701, 528.31800, 528.31801, 528.32800)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF Tuner Oscillator Circuit may be accomplished by removing the Channel Selector and Fine Tuning knobs.

PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety glass cleaning, it is necessary to remove chassis. (See disassembly instructions.)

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions.)

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the Horiz. Oscillator, it is necessary to remove the rear cover and supply power to set. Adjustment is located on top of chassis. Set the Horiz. Hold Control at the center of its range and adjust the Horiz. Freq. slug L17 until picture synchronizes horizontally. (For location see tube placement chart.)

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF Detector Buzz, adjust the Ratio Detector Secondary L16 located on top of chassis. (See tube placement chart.)

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

1. Remove 6 push-on type control knobs from front panel.
2. Remove 6 metal screws. Remove rear cover.
3. Remove 2 wood screws from antenna bracket.
4. Disconnect 2 speaker leads. Remove 2 speaker nuts. Remove speaker
5. Remove 8 wood screws from underside of cabinet.
   (4 located in rubber feet.)
6. Slide cabinet forward and lift from chassis mounting board.

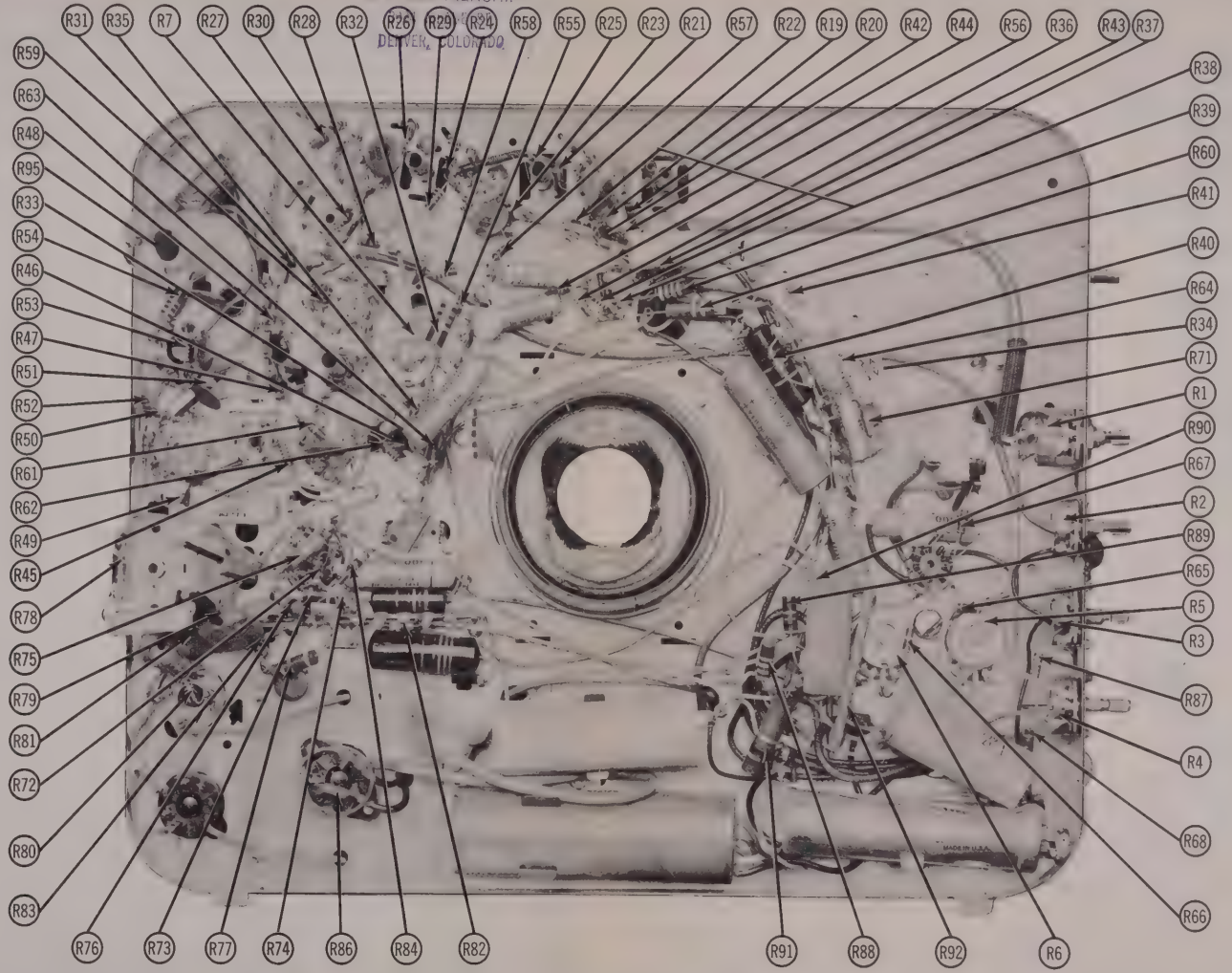
TO REMOVE PICTURE TUBE

Remove picture tube socket.

Remove ion trap.

Remove 1 metal screw from front tube mount band.

Remove picture tube.

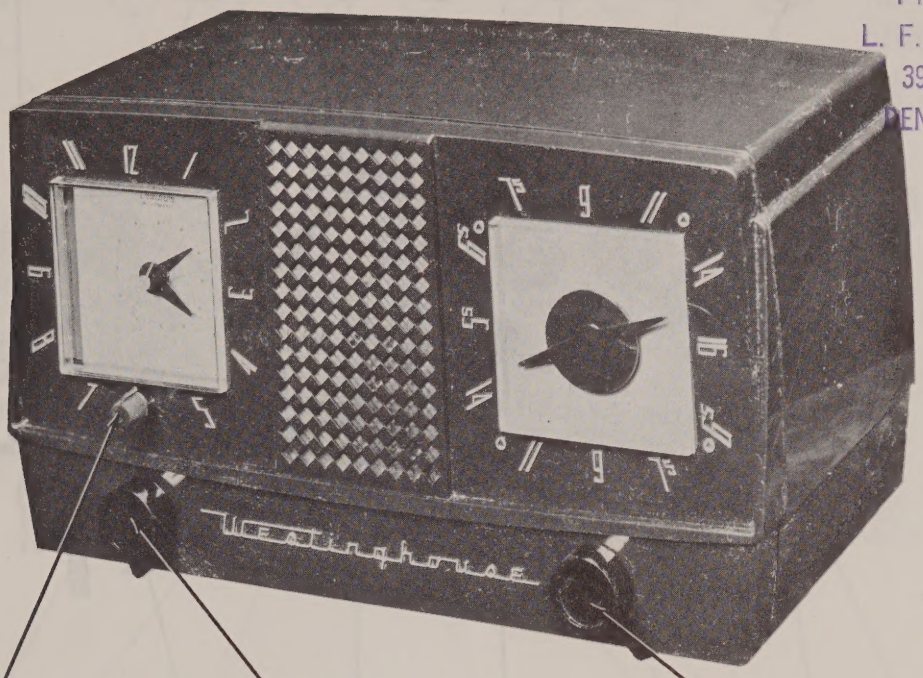


CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

WESTINGHOUSE
MODELS H-420T5, H-421T5

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

WESTINGHOUSE
MODELS H-420T5, H-421T5



WESTINGHOUSE
MODELS H-420T5, H-421T5

TRADE NAME	Westinghouse Model H-420T5, H-421T5 (Ch. V-2157-13)
MANUFACTURER	Westinghouse Electric Corp., TV-Radio Div., Metuchen, N. J.
TYPE SET	AC Operated AM Superheterodyne Receiver With Electric Clock
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AV6 Det-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	105-120 Volts AC-60 Cycles
RATING	.25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540 - 1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer parallel with base of dial.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	200MMF	High side to antenna stator lug on tuning gang. Low side to B-.	455KC (400∿ Mod.)	Tuning gang fully open.	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2	"	"	1625KC	"	"	A5	"
3		Loop	1400KC	Tune to 1400KC signal.	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

WESTINGHOUSE
MODEL H-420T5 (Ch. V-2157-13)

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		WESTINGHOUSE PART No.	STANDARD REPLACEMENT		
V1	Conv.	12BE6	12BE6	7CH	
V2	IF Amp.	12BA6	12BA6	7BK	
V3	Det-AVC-AF Amp.	12AV6	12AV6	7BT	
V4	Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	WESTINGHOUSE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	50	150	V-9991	PRS150/50-50		BBRD5515		TCD49	TVA-2453	Red Orange
B	50	150								
C2	.05	200	RCP10W2503M	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C3A	220									
B	5000									
C	5000		♦V-10789-2	♦PA-113-2	♦PC-151	♦116TM2	♦1408-02		♦DT-2	
D	250									
E										
C4	.01	400	RCP10W4103M	P488-01	D6-103	CUB4S1	CP2-333-103	PT411	4TM-S1	
C5	.047	400	V-10157-4473M	P488-05	DF-103	CUB4S5		PT415	4TM-S5	
C6	.05	400	RCP10W4503M	P488-05	DF-103	CUB4S5		PT415	4TM-S5	

♦ Items C3A, C3B, C3C, C3D, C3E, R5A, R5B and R5C are combined in one unit.
When replacing items individually items C3D and C3E total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Westinghouse PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	V-9993N-9	Q13-133	A47-500K-Z	BSK-60	U-48	Volume - Note 1
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A

Note 1: Some models may use an alternate part no. V-9993-9.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Westinghouse PART No.	IRC PART No.	
R2	22KΩ	½	RC20AE223M	BTS-22K	
R3	68Ω	½	RC20AE680M	BTS-68	
R4	3.3Meg	½	RC20AE335M	BTS-3.3Meg	

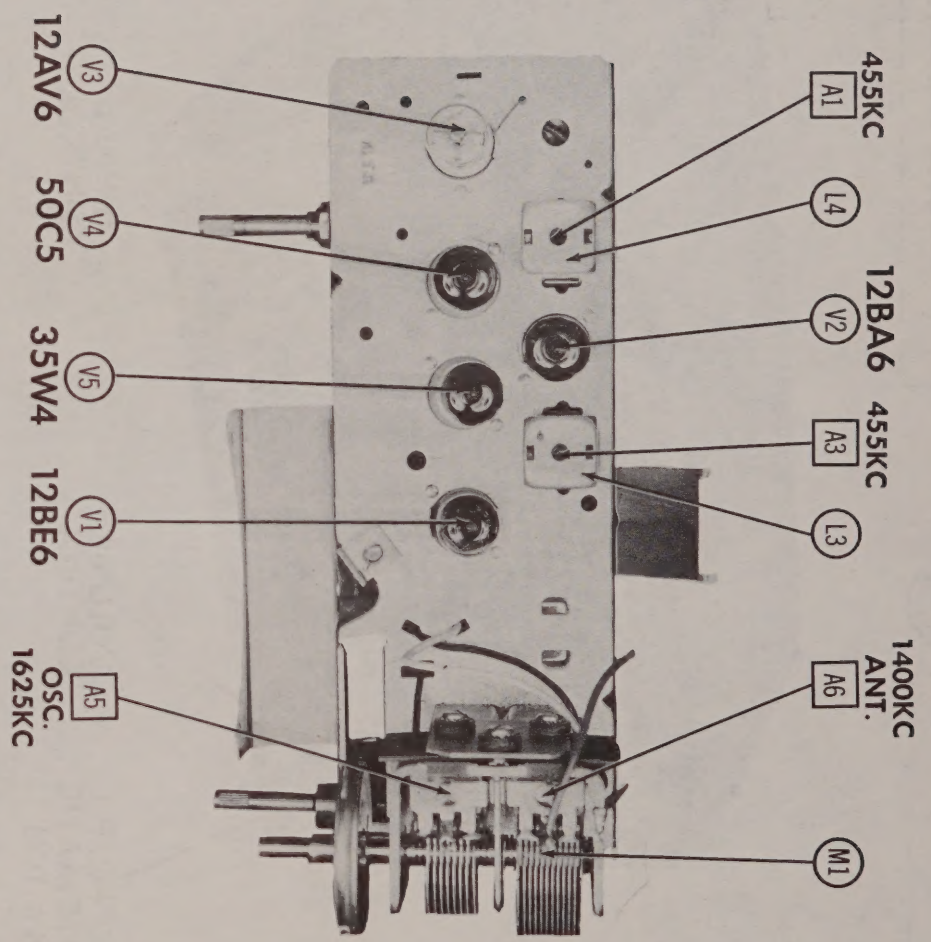
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Westinghouse PART No.	IRC PART No.	
R5A	6.8Meg	½	♦V-10789-2	BTS-6.8Meg	
B	470KΩ	½		BTS-470K	
C	470KΩ	½		BTS-470K	
R6	150Ω	½	RC20AE151M	BTS-150	
R7	1500Ω	1	RC30AE152M	BTA-1500	

♦ Items R5A, R5B, R5C, C3A, C3B, C3C, C3D, C3D are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	WESTINGHOUSE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	2.4KΩ	3.5Ω	Part of Speaker V-9727-3	A-3332	A-3025	S-12X	Z1101		

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	WESTINGHOUSE PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.5Ω	V-9727-3	ST-113 Mod. P4-X	4A07	

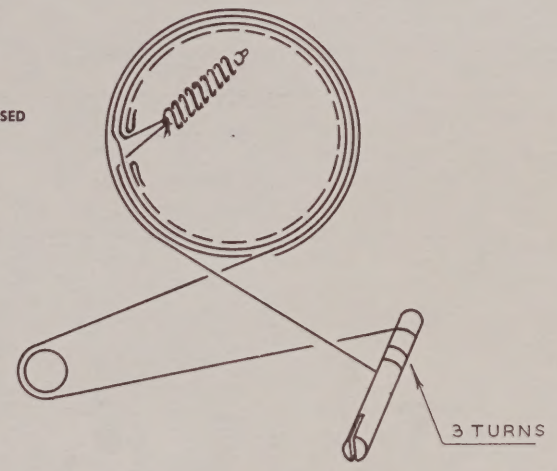
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	WESTINGHOUSE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	2.9Ω		V-11405-4				Includes cab. back
L2	Osc. Coil	.9Ω	12Ω	V-9992	14-1073		69-Osc.*	
L3	Input IF	16Ω	16Ω	V-10945-1	16-6758	BC-352	12-C1	
L4	Output IF	16Ω	16Ω	V-10945-1	16-6758	BC-353	12-C2	

* Drill one mounting hole.

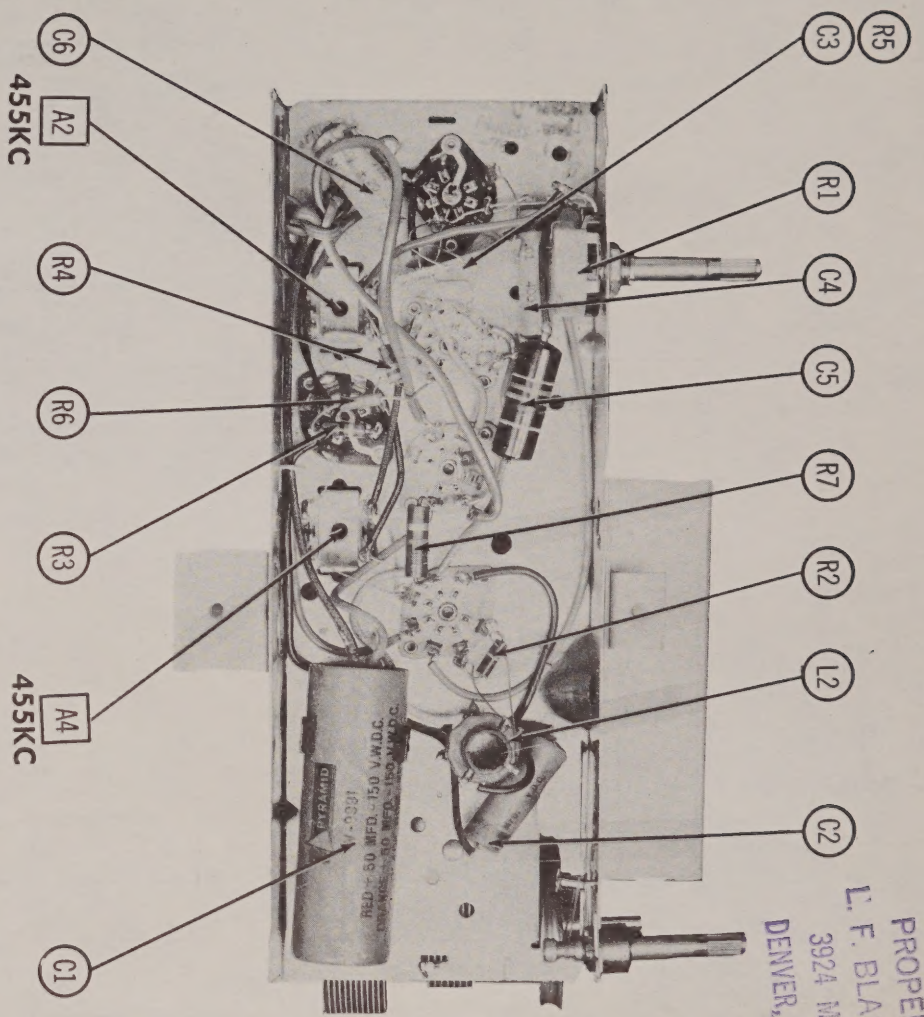
MISCELLANEOUS

ITEM No.	PART NAME	WESTINGHOUSE PART No.	NOTES
M1	Tuning cap.	V-11508-1	14-390MMF., 16-110MMF.
	Cabinet	V-1290-7	Brown - Model H-420T5
	Cabinet	V-1290-8	Ivory - Model H-421T5
	Knob	V-10009-20	Volume & Tuning
	Knob	V-12399-1	Clock
	Dial Pointer	V-11574-3	



DIAL CORD STRINGING

CHASSIS—BOTTOM VIEW



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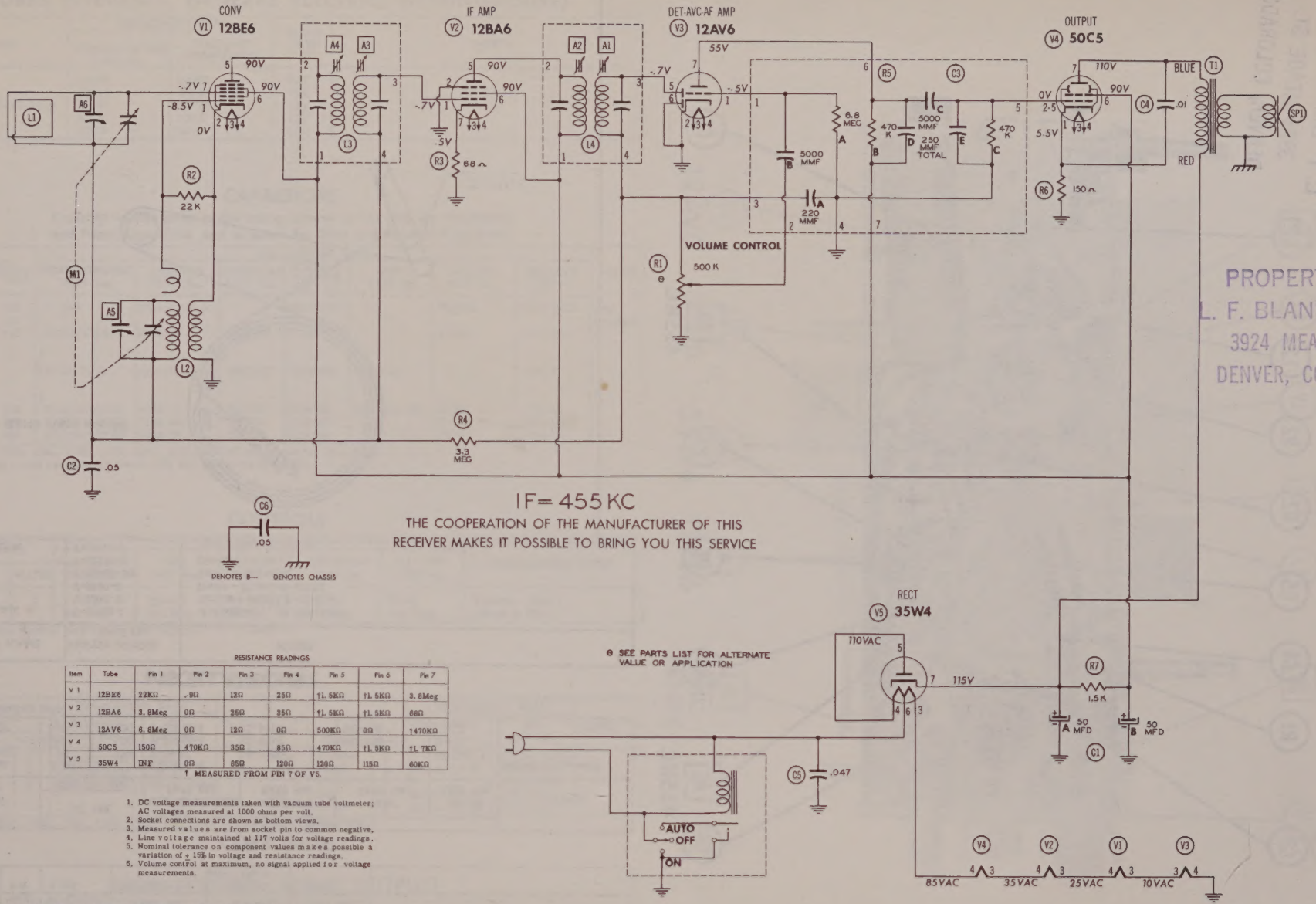
WESTINGHOUSE
MODEL H-420T5 (Ch. V-2157-13)



IF = 455 KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

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DENVER, COLORADO

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.9Ω	12Ω	25Ω	†1.5KΩ	†1.5KΩ	3.8Meg
V 2	12BA6	3.8Meg	0Ω	25Ω	35Ω	†1.5KΩ	†1.5KΩ	68Ω
V 3	12AV6	6.8Meg	0Ω	12Ω	0Ω	500KΩ	0Ω	†470KΩ
V 4	50C5	150Ω	470KΩ	35Ω	85Ω	470KΩ	†1.5KΩ	†1.7KΩ
V 5	35W4	INF	0Ω	85Ω	120Ω	120Ω	115Ω	60KΩ

† MEASURED FROM PIN 7 OF V5.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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